

Internal Note No. 68-FM-163

TECHNICAL
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955 L'Enfant Plaza North, S.W.
Washington, D.C. 20024
NY



NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

MSC INTERNAL NOTE NO. 68-FM-163

July 10, 1968

APR 28 1969

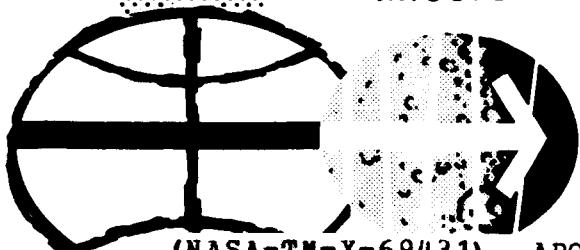
APOLLO 7 (MISSION C) OPERATIONAL
ALTERNATE MISSION PLAN

By Alexie H. Benney, Jr. and Samuel L. Miller

Orbital Mission Analysis Branch



MISSION PLANNING AND ANALYSIS DIVISION



(NASA-TM-X-69431) APOLLO 7 (MISSION C)
OPERATIONAL ALTERNATE MISSION PLAN (NASA)
94 p

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

N74-70876

Unclassified
00/99 16278

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PROJECT APOLLO

APOLLO 7 (MISSION C)
OPERATIONAL ALTERNATE MISSION PLAN

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NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

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TABLES

Table	Page
I ALTERNATE MISSION 1a DESCRIPTION	
(a) Maneuver plan	10
(b) CSM lighting summary	11
(c) Radar acquisition and loss summary for CSM	12
II ALTERNATE MISSION 1c DESCRIPTION	
(a) Maneuver plan	14
(b) CSM lighting summary	15
(c) Radar acquisition and loss summary for CSM	17
III ALTERNATE MISSION 2a DESCRIPTION	
(a) Maneuver plan	20
(b) CSM lighting summary	21
(c) Radar acquisition and loss summary for CSM	24
IV ALTERNATE MISSION 2b DESCRIPTION	
(a) Maneuver plan	29
(b) CSM lighting summary	30
(c) Radar acquisition and loss summary for CSM	33
V ALTERNATE MISSION 2c DESCRIPTION	
(a) Maneuver plan	38
(b) CSM lighting summary	39
(c) Radar acquisition and loss summary for CSM	42
VI ALTERNATE MISSION 3a DESCRIPTION	
(a) Maneuver plan	48
(b) CSM lighting summary	49
(c) Radar acquisition and loss summary for CSM	53
VII ALTERNATE MISSION 3b DESCRIPTION	
(a) Maneuver plan	61
(b) CSM lighting summary	62
(c) Radar acquisition and loss summary for CSM	67

Table		Page
VIII	ALTERNATE MISSION 3c DESCRIPTION	
(a)	Maneuver plan	75
(b)	CSM lighting summary	76
(c)	Radar acquisition and loss summary for CSM	80
IX	MANEUVER PLAN FOR THE ALTERNATE RENDEZVOUS PLAN . . .	88
X	DETAILED TEST OBJECTIVE EVALUATION FOR THE APOLLO 7 ALTERNATE MISSIONS	89

Apollo 7 (MISSION C) OPERATIONAL ALTERNATE MISSION PLAN

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SUMMARY

Current alternate mission strategy being considered for the Apollo 7 mission is presented. Three general alternate missions (1-day, 2-day, and 3-day plans) are presented with specific variations of each depending on whether or not the S-IVB stage is available, spacecraft system lifetime problems, and the amount of available SPS propellant. An alternate rendezvous plan considering a 1-day delay is also presented together with an evaluation of the detailed test objective achieved by the various alternate missions. The maneuver plan, lighting history, and station contacts are included for each alternate plan.

Since none of the proposed alternate mission profiles schedule more maneuvers or require longer system duty cycles than the nominal mission, it is concluded that the consumable margins would be larger than for the nominal mission.

INTRODUCTION

This document presents the current alternate mission strategy being considered for the Apollo 7 mission support and control. This plan together with the known limited capabilities of the vehicle will provide flight control with a comprehensive, but finite, set of alternate missions that could be supported in real time in order to accomplish as many detailed test objectives as possible. The plans presented essentially consider whether or not the S-IVB is available and the amount of SPS propellant available.

These plans consider only the mission profile effects of a functional failure and not an analysis of the failure. The only failures which require any planning are those which (1) abbreviate the duration of the mission, (2) require the spacecraft to expend propellant to attain a safe orbit, or (3) require a delay in the rendezvous. With the exception of the terminal phase of the rendezvous, GNCS failures do not necessarily require any maneuvers to be deleted. Supporting trajectory data and maneuver plans for representative cases of the more complex missions are provided.

SYMBOLS

ANG	Antigua tracking station
COI	Contingency orbit insertion
CM	Command module
CRO	Carnarvon tracking station
CSM	Command and service modules
CYI	Canary Island tracking station
DTO	Detailed test objective
ETR	Eastern Test Range
FDAI	Flight director attitude indicator
G&N	Guidance and navigation
GNCS	Guidance navigation and control system
HAW	Hawaii tracking station
IM	Lunar module
MIL	Milam tracking station
MTVC	Manual thrust vector control
NCC	Corrective combination maneuver
NSR	Concentric maneuver
PUGS	Propellant utilization and gauging system
RCS	Reaction control system
RTACF	Real-Time Auxillary Computing Facility
RTCC	Real-Time Computing Complex
SCS	Stabilization and control system
SLA	Spacecraft-IM adapter

SPS	Service propulsion system
t_{ff}	Time of free fall
TPI	Terminal phase initialization
TVC	Thrust vector control
ΔV	Delta velocity

ALTERNATE MISSION PLANNING GUIDELINES
AND PERTINENT TEST OBJECTIVES

Guidelines

The following agreed upon alternate mission planning guidelines were followed.

1. Missions greater than 3 days in duration will be planned in real time.
2. In addition to alternate missions of 1, 2, or 3 days duration, an alternate rendezvous plan involving a 1-day delay in the rendezvous is considered.
3. Minimize additional crew training.
4. All SPS executed maneuvers, with the exception of the minimum impulse and deorbit burns, will occur over Cape Kennedy or Carnarvon.
5. A preparation time of two orbits is required for an SPS maneuver (ref. 1, section 4-25).
6. Orbited maneuvers were targeted to achieve
 - (a) perigee altitude between 80 and 140 n. mi. in order to stay above minimum perigee heating limit and within SM RCS deorbit capability.
 - (b) maximum apogee altitude below 500 n. mi. in order to minimize radiation hazards (ref. 1, section 4-31).
7. An SPS COI maneuver satisfies the SCS ΔV control DTO.
8. No additional RTCC processors will be necessary. Unusual real-time data processing requirements will be considered for incorporation

into the RTACF.

9. Spacecraft GNCS failure causes the terminal phase of the rendezvous plan to be deleted.

Test Objectives

Many of the DTO's for this mission require spacecraft translation maneuvers and/or specific attitude orientation. Each of the alternate mission profiles generated schedules as many of these trajectory and attitude related objectives as possible within the guidelines stated above and within the specified spacecraft capability. The test objectives are listed and described below. A detailed discussion of each is contained in reference 2.

1. Radiator heat rejection and degradation (M7.19). The objective is to evaluate the performance of the ECS radiators and verify the adequacy of the design as early in the Apollo Program as possible. The required attitude simulation is to maintain an attitude which results in one radiator being pointed toward the earth for 6 hours. This objective is the highest priority test objective for this mission.

2. SPS Performance (P3.15). This objective requires that two gauging sensors in the SPS propellant system be uncovered with a single SPS burn. It is the sixth objective in the DTO priority list. The requirement for the 21st objective in the DTO priority list (primary auxiliary propellant gauging system, P3.16) is identical.

3. GNCS ΔV control (P1.12). GNCS ΔV control is the seventh objective in the DTO priority list. Three maneuvers are required to satisfy the test objective: (1) SPS maneuver from 10-30 seconds in duration, (2) SPS maneuver less than 8 seconds in duration, and (3) RCS maneuver from 2-12 seconds in duration.

4. SCS ΔV control (P2.5). SCS ΔV control is the ninth objective in the DTO priority list. The requirement is for an SPS maneuver that is under SCS control and greater than 5 seconds in duration.

5. Sextant tracking (P1.10). This objective requires that the crew employ the sextant to determine the relative trajectory between the CSM and the S-IVB for use in onboard rendezvous calculations. It is the 13th in the DTO priority list.

6. CSM-active rendezvous (P20.13). The objective is to demonstrate the capability of the CSM to rescue the LM. It is the 14th in the DTO priority list.

7. Separation, transposition, and simulated docking (P20.8). This objective requires that the crew separate the CSM from the S-IVB, turn the CSM such that the crew faces the S-IVB and performs a simulated docking. This objective is the 15th in the DTO priority list.

8. SM-SLA deployment system (P7.21). This objective is the 16th in the DTO priority list. The objective is to verify that the SLA panels are deployed properly for IM extraction.

9. SPS minimum-impulse maneuvers (P3.14). This objective is the 20th in the DTO priority list. The objective requires that two SPS maneuvers less than 1 second in duration be performed. An SPS maneuver of greater length must separate the minimum-impulse tests.

10. GNCS MTVC ΔV takeover (P2.6). This objective is the 22nd in the DTO priority list. The requirement is to allow the crew to manually control the spacecraft attitude for 5 seconds while the SPS engine is burning. Thirty seconds of SPS burn under GNCS control must precede the manual takeover and completion.

The GNCS ΔV control objective requires an SM RCS maneuver under GNCS control. This maneuver would not perturb the trajectory and would merely be a scheduling problem. If the mission is greater than 1 day in length it will be assumed that this objective is satisfied.

DETAILED ALTERNATE MISSION DESCRIPTION

The three general alternate missions (1-day, 2-day, and 3-day plans) and specific variations of each depending on whether or not the SIVB stage is available are presented here. An alternate rendezvous plan considering a 1-day delay is also presented.

A justification of the need for each alternate, a general description of each alternate, and an indication of the DTO's accomplished by each alternate are included. Input spacecraft data and a description of the nominal mission are presented in reference 3. Where the plans assume that a COI has occurred, a vector from such a simulation has been used for initial conditions. A COI burn results in an ellipse with a perigee altitude of 75 n. mi. Nominally the flight dynamics officer will pad the ΔV requirement for a 75-n. mi. perigee and thereby raise perigee. If the ΔV pad is not achieved, the COI burn will be called marginal. Input spacecraft data and a description of the nominal mission are contained in reference 3. Maneuver plans, lighting histories and station contact information have been included for those missions which have been simulated.

The maneuver plans for each alternate contain the following information.

1. Title of maneuver.
2. Ground elapsed time of maneuver.
3. Revolution in which maneuver occurs.
4. The time length of the burn.
5. The total ΔV applied.
6. The ΔV target loads in the external ΔV system.
7. The IMU alignment for the current maneuver.
8. The resultant ellipse.
9. The primary and secondary control modes for the maneuver.
10. The principal station covering the maneuver.
11. Some comments on the purpose of the maneuver.

The maneuver plan tables use four words to describe the IMU alignment to be used for the current maneuver: launch, TPI, preferred, and deorbit. The IMU alignment at launch is used to perform some maneuvers early in the mission and this alignment will be referred to in the maneuver plan tables as launch. The launch alignment has the X-axis of the IMU aligned with the flight azimuth, and the Z-axis aligned with the negative pad vertical. The Y-axis completes a right-handed system.

Approximately three orbits before the TPI burn, the IMU will be aligned such that at TPI burn ignition the outer gimbal angle is 0° , the inner gimbal angle is equal to the elevation angle between the CSM and S-IVB, and the middle gimbal angle is 0° . This IMU alignment is used for both the NCC and NSR maneuvers, and will be referred to in the maneuver plan tables as TPI.

When the IMU is aligned such that the IMU gimbal angles are all 0° at SPS burn ignition, the maneuver plan tables will refer to the IMU alignment as preferred.

When the IMU is aligned such that the IMU gimbal angles are outer = 180° , inner = 180° , and middle = 0° at SPS deorbit burn ignition the maneuver plan tables will refer to the IMU alignment as deorbit. The IMU may be aligned to the deorbit alignment prior to the SPS orbital maneuver preceding the deorbit burn. This requires that the SPS orbital maneuver have little or

no out-of-plane velocity component since the IMU must be torqued to prevent gimbal lock on large out-of-plane velocity changes.

One-Day Mission Plans

There are four plans being considered for 1-day missions. The first two alternates, 1a and 1b, terminate with a landing in the Middle Pacific Recovery Zone in the sixth revolution. Alternate 1a considers a COI, and alternate 1b does not. The third and fourth plans, alternates 1c and 1d, terminate with a landing in the west Atlantic near the end of the first day. Alternate 1c considers a COI, and alternate 1d does not. Nominally, only the deorbit burn would be scheduled; however, if a COI were necessary there would be an additional SPS maneuver. For alternate 1a, it was assumed that the COI was marginal. Alternates 1b and 1d follow the nominal operational trajectory plan until deorbit. Tables I and II present the maneuver plan, lighting history, and station contacts for alternates 1a and 1c, respectively.

Two-Day Mission Plans

Three 2-day mission plans, alternates 2a, 2b, and 2c, are being considered. Two days does not permit all test objectives to be met. The mission can have a rendezvous and two additional SPS maneuvers (one for deorbit) or no rendezvous and four maneuvers (one for deorbit).

Alternate 2a.- Alternate 2a considers that the S-IVB is in an acceptable orbit and has been made safe. In this case, the rendezvous will occur as in the nominal mission, the deorbit will be under GNCS control, and the other maneuver will be used to evaluate SCS control. The SCS burn will occur over Carnarvon in revolution 28. The GNCS deorbit burn will occur over Hawaii in revolution 31, and landing will occur in the west Atlantic in revolution 32. Table III gives the maneuver plan, lighting history, and station contacts for this alternate. If the SCS burn were extended to approximately 70 seconds, the SPS performance and gauging tests could be accomplished.

Alternate 2b.- Alternate 2b assumes that an SCS COI burn of less than 31 seconds has occurred. The first maneuver will be a GNCS burn in revolution 16 over Carnarvon to adjust the propellant level for the gauging system test. If the COI did not satisfy the SCS test requirement, this maneuver would be under SCS control. If the COI were between 28 and 31 seconds, this maneuver could be a minimum-impulse test. A 57-second burn for the SPS performance, gauging and GNCS/MTVC tests will occur over Cape Kennedy in revolution 19. A minimum impulse test will be performed over Carnarvon in revolution 29 and the GNCS deorbit burn over Hawaii occurs in revolution 32 for a west Atlantic landing in revolution 33. Table IV gives the maneuver plan, lighting history, and station contacts. Because

the CSM-active rendezvous objective can be traded for the minimum-impulse, gauging system, and manual takeover tests, this plan may be preferable to the 2a plan when the conditions necessary for entry into the 2a plan exist.

Alternate 2c.- In the third 2-day plan, alternate 2c, it is assumed that the S-IVB is not available and that a COI burn of more than 31 seconds has occurred. The COI burn will suffice for the SCS test. The first scheduled maneuver will be performed over Cape Kennedy in revolution 17. The burn objective will be a minimum impulse test. The second maneuver will occur two revolutions later over Cape Kennedy. Burn objectives will depend on the exact propellant level. The most desirable objective would be a GNCS MTVC maneuver. This requires a minimum maneuver time of 35 seconds. If this duration is impossible, the maneuver will be a GNCS-controlled, orbit-shaping maneuver that uses whatever ΔV is available. The third maneuver will be a second minimum-impulse test. The maneuver will occur over Carnarvon in revolution 29. The deorbit maneuver will occur over Hawaii in revolution 32 and landing will be in the west Atlantic in revolution 33. Table V gives a maneuver plan, lighting history, and station contact history for alternate 2c.

Three-Day Mission Plans

The three-day missions allow all mission objectives to be scheduled. Three plans are presented, alternates 3a, 3b, and 3c.

Alternate 3a.- In the first plan, alternate 3a, it is assumed that the S-IVB is available. The rendezvous will occur as in the nominal mission. In revolution 28 an SCS burn will occur over Carnarvon to adjust the level for the SPS performance and gauging system test. These tests will be performed over Cape Kennedy in revolution 32. A minimum-impulse test will be performed shortly prior to the GNCS deorbit burn, which occurs in revolution 45 over Hawaii. Landing will be in revolution 46 in the west Atlantic. This plan simulates the minimum-impulse test in revolution 42 over the Canary Islands. Table VI presents the maneuver plan, lighting history, and station contacts history.

Alternate 3b.- The second three-day plan, alternate 3b, considers that the S-IVB is not available and that a COI burn of less than 31 seconds has occurred. The first maneuver will be a GNCS-controlled maneuver in revolution 17 over Cape Kennedy to adjust the propellant level for SPS performance and gauging system tests. If the COI burn did not provide a satisfactory SCS test, this maneuver will be under SCS control. The second maneuver will be a minimum-impulse test over Cape Kennedy two revolutions later. The SPS performance and gauging system tests will occur over Cape Kennedy in revolution 32. A second minimum-impulse test will be performed shortly prior to the GNCS deorbit, which occurs in revolution 47 over Hawaii. This simulation reflects the second minimum-impulse test over

the Canary Islands in revolution 43. Landing occurs in the west Atlantic in revolution 48. Table VII presents a maneuver plan, lighting history, and station contacts history for this alternate.

Alternate 3c.—The third 3-day plan, alternate 3c, considers that the S-IVB is unavailable and that a COI burn of more than 31 seconds has occurred. The COI burn will suffice for an SCS test. The first maneuver will be a minimum-impulse test over Cape Kennedy in revolution 17. The second maneuver will occur over Cape Kennedy two revolutions later. The objective of this maneuver will be determined by the propellant level as in alternate 2c. The second minimum-impulse test will occur over Cape Kennedy in revolution 32. The GNCS deorbit burn will occur over Hawaii in revolution 46 to produce a landing in the west Atlantic in revolution 47. Table VIII presents the maneuver plan, lighting history, and station contacts history, respectively.

Alternate Rendezvous Plan

The only alternate rendezvous plan being considered is a 1-day delay. Alternate rendezvous plans with a delay of one revolution are not considered because of the loss of good MSFN coverage. A rendezvous delay of more than 1 day is not considered because of the drag uncertainties of the S-IVB. A 1-day delay in the rendezvous allows approximately the same maneuver plan, the same station coverage, and the same lighting.

The plan involves deleting NCC1 at $26^{\text{h}}25^{\text{m}}$ g.e.t. and making, instead, a SM RCS maneuver to reestablish the near-nominal phasing (CSM leading by about 75 n. mi.) one day later. The SM RCS burn of about 12 fps has been scheduled to occur over Ascension in revolution 18 at about $27^{\text{h}}30^{\text{m}}$ g.e.t. Of course, the rendezvous maneuvers (NCC and NSR) slip approximately one day and the terminal phase follows essentially the same plan as that of the nominal. The remainder of the mission follows the nominal operational trajectory. A maneuver plan is presented in table IX.

ALTERNATE MISSION PROFILE EVALUATION

Table X presents an evaluation of the capability of the alternate mission profiles to satisfy the profile-related test objectives discussed in this document.

Since none of the alternate mission profiles schedules more maneuvers or require longer total mission duration than the nominal mission, it is concluded that a consumables analysis would reflect greater consumable margins than the nominal mission.

TABLE I.- ALTERNATE MISSION 1a DESCRIPTION

(a) Maneuver Plan

Event	Rev no	E.g.e.t., day:hr:min	Burn time sec	ΔV , fps			IMU Alignment	Resultant Ellipse h_a/h_p , n. mi.	TVC Mode		Station Contact	Comments
				Total	ΔV_x	ΔV_y			primary	secondary		
Orbit Insertion COI	1		90				Launch	76/115	SCS	MTVC	ETR	
First SPS Burn	6	00:08:44	11.9	314	-221	0	223	Deorbit	GNCS	SCS	USS Mercury	Deorbit burn $t_{ff} = 10$ min

TABLE I.- ALTERNATE MISSION 1a DESCRIPTION - Continued
 (b) CSM lighting summary

ASSUMED LIFETIME TIME = YEAR 1968		MONTH		DAY 1		HR U		MIN 0		SEC .000		REVOLUTION	
START IN LIGHT AT T = DAY 0	HR U	MIN 13	SEC 40.00	SUN-LIGHT, EARTH-SHIELD		START IN LIGHT AT T = DAY 0	HR U	MIN 13	SEC 40.00	Moon-LIGHT, EARTH-SHIELD			
-----SUNRISE-----													
D H M S	LONG	U M S	LONG	U M S	LONG	U M S	LONG	U M S	LONG	U M S	LONG		
J 1 16 15.07	-162.67	J 1 34 7.040	45.95	J 1 36 29.99	-91.25	J 1 58 40.63	127.13	J 1 37		J 1 58		1.77	
J 2 44 3.64	172.19	J 2 6 50.02	24.05	J 3 3 4 31.073	1.042	J 2 26 38.05	105.99	J 2 29		J 1 58		1.96	
J 4 11 4.031	150.18	J 3 3 2 12.097	-20.32	J 4 32 27.56	-133.06	J 3 54 33.07	84.82	J 3 47		J 2 52		2.71	
J 5 32 31.013	128.06	J 6 2 24 33.077	-42.34	J 6 6 23.47	-153.91	J 5 22 25.75	63.63	J 5 41		J 4 46		3.92	
J 7 7 7.28	102.61	J 7 28 17.21	-174.74	J 8 6 50 16.23	42.46	J 7 54	5.75	J 7 59		J 6 06		5.12	
J 8 34 51.013	84.14	J 7 57 34.05	-61.25	J 8 18 4.68	21.33	J 8 30	6.46	J 8 44		J 7 55		6.06	

TABLE I.- ALTERNATE MISSION 1a DESCRIPTION - Continued

(c) Radar acquisition and loss summary for CSM - Continued

MISSION STATION NAME	ACQUISITION DAY	HR	MIN	SEC	LOSS DAY	HR	MIN	SEC	ELAPSED TIME			MAX ELEVATION DEG	MAX RANGE NM	MIN RANGE NM	REVOLUTION NUMBER
									MIN SEC	SEC	MIN SEC				
HUA (S) USB-3U*	0	13	3	0	0	13	36	0	33	0	33	1.94	791.37	779.88	1011
USS VANGUARD	0	13	3	0	0	17	10	4	7	46.79	870.98	152.64	1016	1016	
CYI (S) USB-3U*	0	17	4	0	0	24	27	7	21	29.68	881.39	208.69	1022	1022	
CRU (S) USB-3U*	0	23	16	0	0	28	15	4	58	5.87	530.32	445.00	1058	1058	
CNB (S) USB-3U*	0	1	54	0	0	4	44	4	1	3.60	683.17	534.81	1065	1065	
USS MUNIVILLE	0	23	33	0	0	29	24	5	50	7.06	806.43	520.69	1091	1091	
GUS (S) USB-3U*	0	23	54	0	0	34	1	5	19	4.85	816.87	617.98	1095	1095	
GYM (S) USB-3U*	0	1	23	0	0	1	35	5	1	7.30	22.90	731.96	254.34	1096	
"HS-12 (FPS-101)	0	1	29	45	0	1	36	55	7	14	20.14	588.65	284.03	1098	1098
TEX (S) USB-3U*	0	1	17	0	0	1	38	47	7	29	37.33	527.95	176.66	2000	2000
MIL (S) USB-3U*	0	1	32	14	0	1	42	36	7	46	26.98	577.96	232.15	2005	2005
GBH (S) USB-3U*	0	1	35	47	0	1	42	56	7	9	16.76	624.69	335.58	2005	2005
ANG-71 USB-3U	0	1	42	35	0	1	44	33	1	7	7.72	836.50	836.50	2008	2008
ADA (S) USB-3U*	0	1	35	0	0	1	46	12	7	37	29.10	779.02	217.53	2110	
USS VANGUARD	0	1	42	1	0	1	49	20	7	8	15.92	800.82	353.74	2114	2114
CYI (S) USB-3U*	0	1	51	0	0	1	54	50	3	55	2.60	840.77	702.07	2118	2118
CRU (S) USB-3U*	0	2	23	44	0	2	31	28	5	43	11.30	657.77	310.05	2159	2159
MAN (S) USB-3U*	0	2	50	15	0	2	56	43	6	25	11.67	663.87	384.65	2083	2083
USS MUNIVILLE	0	23	13	0	0	3	2	37	7	24	51.62	550.20	133.40	2090	2090
GUS (S) USB-3U*	0	3	7	0	0	3	7	8	0	15.93	870.10	339.01	2097	2097	
GYM (S) USB-3U*	0	3	1	6	0	3	8	29	7	24	25.24	601.22	241.01	2097	2097
"HS-15 (FPS-101)	0	3	2	0	0	3	9	34	7	34	31.10	783.76	202.50	2099	2099
TEX (S) USB-3U*	0	3	7	8	0	3	11	25	7	17	17.93	816.91	315.59	2102	2102
MIL (S) USB-3U*	0	3	47	0	0	3	15	17	7	30	34.13	832.50	188.67	3006	3006
GYM (S) USB-3U*	0	3	32	0	0	3	15	57	7	24	19.53	767.76	292.03	3006	3006
BUA (S) USB-3U*	0	3	11	22	0	3	18	12	6	50	13.93	649.39	368.65	3008	3008
ANG-91 USB-3U	0	3	14	41	0	3	19	54	6	10	8.48	718.52	488.16	3110	3110
USS VANGUARD	0	3	17	10	0	3	19	57	3	46	1.88	751.21	746.98	3110	3110
ACN (S) USB-3U*	0	3	47	38	0	3	33	32	5	54	9.51	690.58	396.27	3123	3123
CRO (S) USB-3U*	0	3	58	3	0	4	4	22	6	18	32.22	511.33	137.86	3158	3158
MAN (S) USB-3U*	0	4	22	22	0	4	29	31	7	8	19.03	780.09	281.27	3164	3164
USS MUNIVILLE	0	4	28	10	0	4	34	59	6	49	13.11	683.90	384.85	3169	3169
GUS (S) USB-3U*	0	4	32	22	0	4	39	36	7	14	16.75	771.47	326.18	3176	3176
GYM (S) USB-3U*	0	4	47	47	0	4	41	6	7	18	24.75	605.33	242.12	3176	3176
"HS-15 (FPS-101)	0	4	34	36	0	4	42	4	7	27	25.38	770.21	234.73	3178	3178
TEX (S) USB-3U*	0	4	50	21	0	4	44	18	7	27	33.38	818.97	187.50	4001	4001
MIL (S) USB-3U*	0	4	32	40	0	4	47	34	7	1	14.25	755.45	356.81	4005	4005
GBH (S) USB-3U*	0	4	41	13	0	4	48	23	7	9	24.87	581.79	231.09	4005	4005
BUA (S) USB-3U*	0	4	56	56	0	4	47	13	0	16	812.75	832.75	161.37	4008	4008
ANG-91 USB-3U	0	4	52	56	0	4	52	56	7	9	36.79	571.82	161.37	4008	4008

TABLE I.- ALTERNATE MISSION 1a DESCRIPTION - Concluded
 (c) Radar acquisition and loss summary for CSM - Concluded

MISSION STATION	ACQUISITION				DATE	HR	MIN	SEC	DEG	MAX ELEVATION	MAX RANGE	MIN RANGE	N MI	W MI	REVOLUTION NUMBER	
	NAUT	NAUT	HR	MIN												
ACN (S) USO-3U*	5	1	0	0	0	5	5	5	5	47	100.15	597.13	360.43	4.22	4.54	
CRU (S) USO-3U*	5	32	44	0	0	33	43	1	0	53	704.28	704.28	4.54	4.54	4.54	
GFM (S) USO-3U*	5	41	57	0	0	43	56	6	41	65	556.42	556.42	4.67	4.67	4.67	
HAW (S) USO-3U*	5	55	51	0	0	6	1	43	51	70.05	759.53	759.53	4.63	4.63	4.63	
MHS (S) USO-3U*	5	55	51	0	0	6	1	43	51	70.05	532.04	532.04	4.63	4.63	4.63	
USS MURRAYVILLE	6	1	13	0	0	6	7	50	37	100.78	729.29	427.55	4.90	4.90	4.90	
USS (S) USO-3U*	6	2	2	0	0	6	11	25	6	22	9.16	848.80	466.01	4.95	4.95	4.95
GYM (S) USO-3U*	6	4	22	0	0	6	13	45	7	22	21.00	716.26	267.31	4.97	4.97	4.97
MHS-15 (475-10E)	6	7	24	0	0	6	13	46	6	23	10.38	713.01	429.30	4.97	4.97	4.97
TEX (S) USO-3U*	6	7	33	0	0	6	16	17	6	44	14.57	606.92	341.84	4.99	4.99	4.99
GDI (S) USO-3U*	6	16	9	0	0	6	17	46	1	37	0.83	774.15	774.15	5.01	5.01	5.01
USS MERCURY	7	11	13	0	0	7	15	54	1	41	0.93	750.85	750.85	5.61	5.61	5.61
GFM (S) USO-3U*	7	47	45	0	0	7	20	43	5	59	8.44	743.19	455.31	5.65	5.65	5.65
HAW (S) USO-3U*	7	49	6	0	0	7	34	29	5	22	5.10	850.04	599.39	5.82	5.82	5.82
USS MUNTVILLE	7	53	34	0	0	7	40	54	7	15	33.16	532.54	161.65	5.89	5.89	5.89
GYM (S) USO-3U*	7	53	43	0	0	7	44	47	5	3	4.44	638.18	599.66	5.93	5.93	5.93
USS MERCURY	8	43	44	0	0	8	50	11	6	27	29.14	786.74	174.90	6.64	6.64	6.64

TABLE II.- ALTERNATE MISSION 1c DESCRIPTION

(a) Maneuver Plan

Event	Rev no	g.e.t., day:hr:min	Burn time sec	ΔV , fps			IMU Alignment	Resultant h_a/h_p , n. mi.	TVC Mode		Station Contact	Comments
				Total	ΔV_x	ΔV_y			primary	secondary		
Orbit Insertion COI	1			39			Launch	123/126	SCS	MTC	ETR	
First SPS Burn	17	01:02:37	14.7	321	-219	0	235	Deorbit	GNCS	SCS	HAW	Deorbit burn $t_{ff} = 13$ min

TABLE II.- ALTERNATE MISSION Ic DESCRIPTION - Continued
 (b) CSM lighting summary

ASSUMED LIFTOFF TIME = YEAR 1968		MONTH 8		DAY 1		HR 0		MIN 0		SEC .000	
START IN	LIGHT AT 1 = DAY 0	HR 0	MIN 12	S _{LL}	27.00	SUN-LIGHT, EARTH-SHIELD					
START IN	LIGHT AT T= DAY 0	HR 0	MIN 12	S _{LC}	27.00	MOON-LIGHT, EARTH-SHIELD					
<u>-----SUNRISE-----</u>											
D H M	S	LONG	U H M S	LONG	U H M S	LONG	U H M S	LONG	U H M S	LONG	REVOLUTION
0 1 16	23.062	-168.20	0 2 6	37.46	25.95	0 1 37	19.16	-92.10	0 1 0	3.24	131.05
0 2 45	23.072	169.02	0 3 37	24.76	3.33	0 3 6	19.48	-113.78	0 2 29	6.82	109.59
0 4 14	13.031	147.30	0 5 6	24.23	-18.04	0 4 35	29.97	-134.67	0 3 58	14.00	88.43
0 5 43	9.085	125.17	0 6 35	11.81	-41.22	0 6 4	27.68	-156.51	0 5 27	14.67	66.77
0 7 12	1.078	102.79	0 8 4	6.73	-63.41	0 7 33	39.44	-171.25	0 6 56	24.34	45.81
0 8 40	54.11	80.45	0 9 32	58.86	-85.73	0 9 2	37.97	161.00	0 7 25	21.99	23.94
0 10 9	44.07	58.26	0 11 1	49.87	-106.11	0 10 31	47.71	440.14	0 8 25	32.71	3.07
0 11 38	35.98	35.66	0 12 30	45.87	-130.20	0 12 0	48.52	118.61	0 9 54	28.74	-18.90
0 13 7	34.95	13.70				0 11 23	28.74		0 12 52	38.01	-39.87

TABLE II.- ALTERNATE MISSION 1c DESCRIPTION - Continued
 (b) CSM lighting summary - Concluded

SUNRISE			SUNSET			MOONRISE			MOONSET			REVOLUTION			
D	H	M	S	LONG	D	H	M	S	LONG	D	H	M	S	LONG	
0	14	36	21.54	-88.91	0	13	59	33.53	-152.73	0	13	29	54.93	97.52	9.50
0	16	5	14.14	-30.92	0	15	28	32.82	-174.63	0	14	58	57.49	76.16	9.81
0	17	34	8.15	-53.97	0	18	26	12.66	140.62	0	17	57	5.11	33.66	10.06
0	19	3	1.18	-75.60	0	19	55	2.01	118.23	0	19	26	6.55	12.27	10.45
0	20	31	53.42	-97.06	0	21	23	52.33	95.90	0	20	55	11.52	-8.66	11.20
0	22	0	40.44	-120.39	0	22	57	46.64	73.80	0	22	24	11.11	-30.37	11.76
0	23	29	37.06	-142.40	1	0	21	33.08	51.28	0	23	53	16.85	-51.41	12.02
1	0	58	22.22	-165.01	1	1	56	31.42	29.42	1	1	22	14.89	-73.01	12.38
1	2	27	14.65	173.00						1	2	13	52.82	126.55	12.71

TABLE II.- ALTERNATE MISSION 1c DESCRIPTION - Continued
 (c) Radar acquisition and loss summary for CSM

MSFN STATION	ACQUISITION	LOSS	ELAPSED TIME	MAX ELEVATION	MAX RANGE	MIN RANGE	REVOLUTION	
NAME	DAY HR MIN SEC	DAY HR MIN SEC	MIN SEC	DEG	N MI	N MI	NUMBER	
AUA (S) USB-3U*	0 12 24	0 13 39	1 12	40.82	684.80	673.35	1.1	
USS VANGUARD	0 12 26	0 17 16	4 50	29.62	764.14	231.70	1.15	
CYI (S) USB-3U*	0 16 45	0 24 28	7 42	35.03	541.23	20.26	1.22	
CHO (S) USB-3U*	0 52 34	0 59 46	7 10	12.67	699.74	443.56	1.59	
CNB (S) USB-85*	1 16	0 1 42	6 26	7.14	889.10	592.89	1.68	
USS MUNTVILLE	1 24	0 30 42	6 39	8.73	882.59	530.32	1.91	
GUS (S) USB-85*	1 29	0 1 35	5 50	6.30	761.01	611.09	1.96	
GYH (S) USB-3U*	1 29 3	0 1 36	5 59	7 36	38.73	822.60	1.98	
WHS-15 (FPS-16H)	1 30	0 1 38	6 7	22.81	584.21	283.17	1.98	
TEX (S) USB-3D*	1 32 5	0 39 57	7 52	31.56	835.92	220.07	2.01	
MIL (S) USB-3U*	1 35	0 1 43	46	23.66	813.05	276.89	2.06	
GBM (S) USB-3U*	1 36	0 1 44	9 7	18.36	593.46	335.69	2.06	
ANG-91 (S) USB-3U*	1 43 14	0 1 46	12 2	5.47	830.58	830.58	2.09	
BDA (S) USB-3U*	1 39	0 1 47	22 58	26.33	741.38	254.23	2.10	
USS VANGUARD	1 43 9	0 50 39	7 30	19.59	884.88	319.10	2.15	
CYI (S) USB-3U*	1 51	0 1 56	33 4	3.66	902.49	717.05	2.20	
CRO (S) USB-3U*	2 26	0 2 34	10 7	34	21.48	590.90	305.54	
HAW (S) USB-3U*	2 51	0 2 59	13 7	12.64	807.18	429.82	2.84	
USS MUNTVILLE	2 57 0	0 3 4	56 7	42.17	832.67	174.98	2.91	
GUS (S) USB-85*	3 2	0 3 9	37 7	17.23	840.41	350.37	2.96	
GYH (S) USB-3U*	3 3	0 10 45	7 44	26.52	849.52	252.79	2.98	
WHS-15 (FPS-16H)	3 4	0 3 11	59 7	41.93	827.72	175.17	2.99	
TEX (S) USB-3U*	3 6	0 3 13	52 7	21.32	862.48	299.94	3.01	
MIL (S) USB-3U*	3 9	0 3 17	48 7	30.73	788.84	224.05	3.05	
GBM (S) USB-3D*	3 16	0 3 18	20 7	31.89	523.60	217.50	3.05	
BIA (S) USB-3U*	3 17	0 3 20	34 7	14.68	898.94	391.55	3.10	
ANG-91 (S) USB-3U*	3 15	0 3 22	24 6	15	9.92	761.94	495.76	3.10
USS VANGUARD	3 17	0 3 22	41 4	42	3.48	883.83	726.60	3.12
ACN (S) USB-3D*	3 24	0 3 36	35 7	14.44	900.41	393.03	3.24	
CRO (S) USB-3D*	4 15	0 3 4	8 9	38.19	880.99	192.25	3.58	
HAW (S) USB-3D*	4 23	0 3 4	33 9	7 45	21.37	788.21	297.08	3.84
USS MUNTVILLE	4 31	0 3 4	38 7	1 42	902.87	397.72	3.91	
GDS (S) USB-85*	4 35	0 3 4	43 7	41	16.60	771.66	331.10	3.96
GYH (S) USB-3U*	4 37	0 4 4	44 46	27.13	864.15	247.83	3.98	
WHS-15 (FPS-16H)	4 48	0 4 45	42 7	28.07	775.50	239.63	3.99	
TEX (S) USB-3D*	4 40	0 4 47	58 7	38.40	825.34	187.47	4.00	
MIL (S) USB-3U*	4 44	0 4 51	19 7	15.99	767.33	367.72	4.05	
GBM (S) USB-3D*	4 44	0 4 52	6 7	26.61	910.19	249.82	4.05	
BDA (S) USB-3U*	4 49	0 4 51	20 1	5.95	855.21	855.21	4.05	
ANG-91 (S) USB-3U	4 56	0 4 56	46 7	36.37	856.75	194.02	4.10	

TABLE II.- ALTERNATE MISSION 1c DESCRIPTION - Continued

(c) Radar acquisition and loss summary for CSM - Continued

MSFN STATION	ACQUISITION	LOSS						ELAPSED TIME			MAX ELEVATION			MAX RANGE			MIN RANGE			REVOLUTION NUMBER	
		DAY	HR	MIN	SEC	DAY	HR	MIN	SEC	MIN	SEC	DEG	N	MI	N	MI	N	MI			
ACN (S) USB-3U*		5	3	7		0	0	5	55	7	11	14.15	654.17	401.40	4.21						
CRO (S) USB-3U*		0	5	35	24	0	0	5	55	4	44	2.82	789.76	764.11	4.55						
GWH (S) USB-3U*		5	45	54		0	5	53	39	7	45	22.16	795.67	289.09	4.68						
(S) USB-3U*		0	6	13		0	0	6	36	6	23	7.16	897.53	580.44	4.84						
USS HUNTSVILLE		0	5	33		0	0	12	44	7	10	12.56	872.92	434.42	4.91						
GDS (S) USB-85*		0	6	9	23	0	0	6	16	6	56	11.88	712.30	446.68	4.93						
GYH (S) USB-3U*		0	10	44		0	0	6	18	7	49	45.97	884.57	163.32	4.97						
WHS-15 (FPS-16n)		6	11	49		0	6	18	44	6	54	10.61	864.02	476.10	4.97						
MJL (S) USB-3U*		0	19	37		0	0	6	22	2	48	1.21	840.20	840.20	4.99						
TEX (S) USB-3U*		6	14	1		0	0	6	21	17	15	1.31	824.49	419.57	4.99						
GBM (S) USB-3U*		0	19	59		0	0	6	23	17	3	1.35	853.96	831.26	5.01						
ANG-91 USB-3U		0	25	19		0	0	6	27	2	17	1.14	842.56	842.56	5.05						
USS MERCURY		0	18	20		0	0	7	23	10	49	3.67	887.41	718.24	5.63						
GWH (S) USB-3U*		0	20	11		0	0	7	26	57	6	8.66	856.32	525.93	5.67						
HAW (S) USB-3U*		7	34	43		0	0	7	40	51	6	6.52	855.82	601.87	5.84						
GDS (S) USB-85*		0	7	45	4	0	0	7	47	15	2	1.1	.95	853.08	853.08	5.90					
USS HUNTSVILLE		0	7	39	15	0	0	7	47	8	53	27.89	787.47	241.23	5.90						
GYM (S) USB-3U*		7	45	23		0	0	7	51	11	58	6.18	799.25	611.94	5.94						
USS MERCURY		0	8	24		0	0	8	58	11	46	42.15	892.31	174.47	6.62						
HAW (S) USB-3U*		0	9	19	0	0	9	15	44	7	24	1.695	877.12	351.41	6.83						
USS HUNTSVILLE		0	9	17	0	0	9	20	25	7	7	13.95	683.38	402.12	6.87						
USS MERCURY		10	24	23		0	0	10	31	54	7	31	19.42	893.19	321.14	7.62					
HAW (S) USB-3U*		0	10	41	57	0	0	10	39	39	7	42	22.53	803.72	791.97	7.62					
GWH (S) USB-3U*		0	11	56	43	0	0	12	5	48	7	4	12.59	678.35	433.00	8.62					
HAW (S) USB-3U*		0	12	16		0	0	12	19	48	1	32	*.34	885.09	885.09	8.77					
USS REUSIONE		0	12	57		0	0	12	38	31	7	34	22.20	919.94	291.88	8.94					
ACN (S) USB-3U*		0	12	57	28	0	0	13	3	33	6	4	6.83	757.52	595.61	9.23					
USS MERCURY		0	13	32	36	0	0	13	40	10	7	3.4	23.20	571.65	278.74	9.42					
GWH (S) USB-3U*		0	13	36	54	0	0	13	45	8	6	1.3	7.33	805.26	570.37	9.68					
USS REDSTONE		0	14	39	0	0	14	12	24	7	45	29.89	524.03	233.19	9.94						
ACN (S) USB-3U*		0	14	39	28	0	0	14	36	13	7	45	40.87	909.23	178.30	10.22					
USS MERCURY		0	15	6	21	0	0	15	14	2	41	30.36	882.11	223.50	10.61						
GWH (S) USB-3U*		0	15	11	57	0	0	15	19	48	7	51	31.97	799.13	213.35	10.67					
USS REDSTONE		0	15	38	59	0	0	15	46	12	13	13.45	445.72	424.25	10.94						
ACN (S) USB-3U*		0	16	6	15	0	0	16	6	35	0	19	*.11	902.62	902.62	11.18					
USS MERCURY		0	16	41	48	0	0	16	45	20	3	3.2	1.52	831.55	818.91	11.58					
GWH (S) USB-3U*		0	16	48	6	0	0	16	50	47	2	40	.65	876.52	868.07	11.63					
USS REUSIONE		0	17	12	58	0	0	17	20	28	7	29	17.77	629.50	350.33	11.94					
CYI (S) USB-3U*		0	17	42	33	0	0	17	49	43	10	14.37	483.54	395.67	12.24						
MAD (S) USB-85*		0	17	48	21	0	0	17	50	55	2	34	*.66	694.52	872.82	12.24					
CNB (S) USB-85*		0	18	5	0	0	18	30	59	0	54	*.41	890.83	890.83	12.68						
USS REUSIONE		0	18	46	40	0	0	18	54	34	7	53	6.86	906.48	131.95	12.95					
ANG-91 USB-3U		0	19	5	8	0	0	19	11	57	6	49	10.96	668.74	467.34	13.10					
USS VANGUARD		0	19	12	26	0	0	19	14	34	2	8	14.37	905.51	903.57	13.14					
CYI (S) USB-30*		0	19	15	46	0	0	19	23	43	7	57	30.02	765.79	227.40	13.24					
MAD (S) USB-85*		0	19	19	46	0	0	19	25	47	5	59	6.76	797.17	593.04	13.26					
CRO (S) USB-30*		0	19	52	45	0	0	19	58	6	20	4.22	709.16	692.64	13.59						
CNB (S) USB-85*		0	20	0	22	0	0	20	7	13	6	50	10.03	893.64	499.71	13.70					
USS REUSIONE		0	21	14	0	0	21	14	0	27	7	5	6.21	817.15	617.63	13.92					

TABLE II.- ALTERNATE MISSION 1c DESCRIPTION - Concluded
 (c) Radar acquisition and loss summary for CSM - Concluded

MSFN STATION	ACQUISITION			LOSS			ELAPSED TIME			MAX ELEVATION			MAX RANGE			MIN RANGE			REVOLUTION NUMBER		
	NAME	DAY	HR	MIN	SEC	DAY	HR	MIN	SEC	MIN	SEC	DEG	N MI	N MI	N MI	N MI	N MI	N MI	N MI	N MI	
GBM (S) USB-3U*	0	20	37	52	0	0	20	41	55	4	2	2°41'	777.45	14.05							
BDA (S) USB-3U*	0	20	40	59	0	0	20	45	46	4	47	3.25	831.95	14.09							
ANG-91 USB-3U	0	20	36	25	0	0	20	46	4	7	39	26.67	757.60	7.36.44							
USS VANGUARD	0	20	43	9	0	0	20	50	19	7	9	14.29	894.41	24.01							
CYI (S) USB-3U*	0	20	49	49	0	0	20	57	30	7	40	18.22	658.90	397.52							
MAU (S) USB-85*	0	20	52	56	0	0	20	59	8	6	12	7.43	782.29	335.34							
CRO (S) USB-3U*	0	21	24	55	0	0	21	32	51	7	55	45.63	804.70	568.99							
GMB (S) USB-3U*	0	21	33	20	0	0	21	41	3	7	43	19.91	856.76	145.78							
CNB (S) USB-3U*	0	22	7	10	0	0	22	11	50	4	39	2.87	818.43	319.84							
TEX (S) USB-3U*	0	22	11	19	0	0	22	16	37	7	17	15.52	753.87	15.00							
MIL (S) USA-3U*	0	22	19	19	0	0	22	22	13	7	47	22.17	893.99	375.13							
GBM (S) USB-3U*	0	22	9	22	0	0	22	17	13	7	47	775.08	288.30	15.07							
BDA (S) USB-3U*	0	22	12	55	0	0	22	20	27	7	31	22.26	592.37	287.95							
ANG-91 USB-3U	0	22	13	44	0	0	22	18	51	5	6	4.18	862.42	695.06							
USS VANGUARD	0	22	16	27	0	0	22	24	14	7	47	46.73	904.78	161.36							
CYI (S) USB-3U*	0	22	23	41	0	0	22	31	33	7	52	23.31	750.41	276.59							
MAO (S) USB-65*	0	22	27	11	0	0	22	31	13	4	1	2.46	821.92	778.42							
CRO (S) USB-3U*	0	22	58	58	0	0	23	6	29	7	30	18.58	621.10	336.81							
CNB (S) USB-85*	0	23	6	56	0	0	23	14	27	7	40	6.11	611.91	322.29							
GYM (S) USB-3U*	0	23	16	51	0	0	23	23	43	6	39	9.73	738.65	499.43							
HHS-15 (FPS-16H)	0	23	36	45	0	0	23	44	22	5	37	4.85	671.15	664.00							
TEX (S) USB-3U*	0	23	39	0	0	0	23	46	45	7	45	30.75	844.51	222.39							
MIL (S) USB-3U*	0	23	42	42	0	0	23	50	30	7	47	6.020	517.49	136.50							
GBM (S) USB-3U*	0	23	43	11	0	0	23	50	56	7	44	24.26	830.76	269.25							
ANG-91 USB-30*	0	23	50	22	0	0	23	50	45	0	23	.16	901.97	901.97							
BDA (S) USB-30*	0	23	56	29	0	0	23	54	17	7	48	62.89	908.87	133.24							
USS VANGUARD	0	23	59	5	0	0	23	57	58	7	52	38.22	831.59	187.23							
CYI (S) USB-3U*	0	23	57	29	1	0	5	7	37	19.06	787.89	321.48									
CRO (S) USB-3U*	0	23	59	18	1	0	40	26	5	7	40	12.51	705.00	442.57							
CNB (S) USB-85*	0	24	6	41	0	0	41	0	47	5	59	6.50	823.24	609.46							
USS HUNTSVILLE	0	24	11	30	1	0	41	1	34	7	40	13.04	908.84	420.60							
GDS (S) USB-85*	0	24	16	41	1	0	41	1	34	7	40	7.54	805.75	564.15							
GYM (S) USB-3U*	0	24	17	21	1	0	41	1	24	7	46	16.34	857.86	362.30							
BDA (S) USB-30*	0	24	20	9	1	0	41	1	28	0	7	37.42	845.10	17.07							
TEX (S) USB-3U*	0	24	37	47	1	0	41	20	29	7	42	32.21	550.33	214.65							
HHS-15 (FPS-16H)	0	24	51	5	1	0	44	7	39	25.18	866.49	259.83									
MIL (S) USB-30*	0	24	56	41	1	0	44	22	7	40	29.22	528.55	231.91								
GBM (S) USB-3U*	0	24	59	53	1	0	44	24	48	7	26	1.74	805.89	805.89							
BDA (S) USB-30*	0	24	57	29	1	0	44	28	0	7	50	23.19	864.60	295.02							
ANG-91 USB-3U*	0	24	59	12	1	0	44	31	27	15	35	1.51	830.29	823.38							
USS VANGUARD	0	24	59	23	1	0	44	31	13	7	49	1.36	799.22	412.48							
CYI (S) USB-3U*	0	24	59	33	1	0	44	36	25	3	18	1.74	805.72	805.89							
CRO (S) USB-30*	0	24	59	7	1	0	44	24	49	7	45	23.19	864.60	295.02							
HAM (S) USB-30*	0	24	59	32	2	0	44	29	1	2	45	22.52	895.18	282.63							
ANG-91 USB-3U*	0	24	59	37	2	0	44	37	49	1	50	7	40	40.72	877.40	157.96					
USS HUNTSVILLE	0	24	59	43	2	0	44	49	0	7	50	15.80	826.78	275.39							
GDS (S) USB-85*	0	24	59	43	4	0	44	50	1	5	5	18.57	805.72	230.80							
GYM (S) USB-30*	0	24	59	43	13	0	44	50	16	6	2	1	18.57								

TABLE III.- ALTERNATE MISSION 2a DESCRIPTION

(a) Maneuver Plan

Event	Rev no	g.e.t., day:hr:min	Burn time sec	ΔV , fps			IMU Alignment	Resultant Ellipse h_a/h_p , n. mi.	TVC Mode		Station Contact	Comment
				Total	ΔV_x	ΔV_y			primary	secondary		
Orbit Insertion	1						Launch	123/153			ETR	Nominal insertion
S-IVB/CSM Separation (RCS)	2	00:02:55	2.6	1	1	0	Launch	127/172	GNCS	SCS	HAW	Set up proper phase offset for rendezvous
SM RCS Phasing Maneuver	3	00:03:20	19.2	7.5	-7.5	0	Launch	126/168	GNCS	SCS	ANG	
First SPS burn	17	01:02:25	10.1	209	55	1	202	TPI	121/198	GNCS	CRO	NCC
Second SPS burn	18	01:04:00	8.8	186	-88	0	-164	TPI	117/157	GNCS	CRO	NSR
Third SPS burn	28	01:19:59	22.7	486	132	0	-1468	Deorbit	92/271	SCS	GNCS	CRO
Fourth SPS burn	31	02:01:17	12.3	277	-171	0	218	Deorbit		GNCS	SCS	HAW
												Deorbit burn $t_{ff} = 16$ min

TABLE III.- ALTERNATE MISSION 2a DESCRIPTION - Continued
 (b) CSM lighting summary

ASSUMED LIFTOFF TIME = YEAR 1968			MONTH	8	DAY	1	HR	0	MIN	0	SEC	.0001
START IN LIGHT AT T = DAY 0	HR	2	MIN	54	SEC	55.00	SUN-LIGHT, EARTH-SHIELD					
START IN UMBRA AT T = DAY 0	HR	2	MIN	54	SEC	55.00	MOON-LIGHT, EARTH-SHIELD					
-----SUNRISE-----	D	H	M	S	LONG	-----MOONRISE-----	D	H	M	S	LONG	-----MOONSET-----
							D	H	M	S		REVOLUTION
0 4 16 7.54	145.83	0 3 39 33.34	4.77	0 3 7 43.77	-114.01	0 4 37 39.24	-136.52	0 4 0 45.23	90.16	3.24	3.49	2.92
0 5 45 53.65	123.43	0 5 9 16.74	-17.75	0 6 7 35.10	-156.99	0 6 30 40.69	-68.60	4.43	3.63	3.66	4.19	
0 7 15 38.95	101.00	0 6 39 1.02	-40.22	0 7 37 30.74	-178.47	0 7 0 36.10	47.03	4.67	5.12	5.37	5.51	
0 8 45 23.28	78.52	0 8 8 46.00	-62.04	0 9 7 26.14	160.06	0 9 30 31.44	25.46	5.74	6.06	6.32	6.46	
0 10 15 6.39	55.99	0 9 38 31.57	-85.02	0 10 37 21.29	138.57	0 10 0 26.73	3.87	7.26	7.39	7.63	7.79	
0 11 44 46.00	33.38	0 11 6 16.25	-107.44	0 11 30 21.98	-17.68	0 11 0 15.60	-37.37	8.33	8.56	8.87	9.12	
0 13 14 27.64	10.68	0 12 37 55.70	+130.13	0 12 7 16.18	117.08	0 13 0 15.60	-37.37	9.27	9.50	9.81	10.06	
0 14 44 10.97	-11.83	0 14 7 36.73	-152.73	0 13 37 10.78	95.57	0 14 30 8.18	-61.14	10.19	10.45	10.75	11.00	

TABLE III.- ALTERNATE MISSION 2a DESCRIPTION - Continued
 (b) CSM lighting summary - Continued

SUNRISE			SUNSET			MOONRISE			MOONSET			REVOLUTION			
D	H	S	D	H	S	D	H	M	S	LONG	D	H	M	S	LONG
0	16	13	56.50	-34.021		0	17	7	2.34	162.29	0	16	36	59.05	52.53
0	17	43	41.17	-56.63		0	18	36	46.46	139.88	0	18	6	52.66	30.99
0	19	13	24.74	-79.09		0	20	6	31.26	117.91	0	19	36	45.67	9.42
0	20	43	7.11	-101.62		0	21	36	14.66	95.08	0	21	6	38.66	-12.16
0	22	12	47.78	-124.23		0	23	5	53.19	72.40	0	22	36	30.98	-33.77
0	23	42	26.30	-146.95		0	23	5	33.46	49.62	1	0	6	22.76	-55.42
1	1	12	9.36	-169.42		1	2	5	15.08	27.31	1	1	36	16.48	-76.91
1	2	5	26.97	27.98		1	2	5	19.16	27.53					
1	2	42	3.21	169.20		1	3	35	53.85	6.59					
1	4	12	10.78	145.70		1	5	4	55.76	-17.90	1	4	36	40.15	-119.31
1	5	41	28.12	123.05		1	6	34	27.52	-40.25	1	6	6	8.31	-141.44
1	7	11	8.24	100.77		1	8	4	7.71	-62.52	1	7	35	58.09	-162.82
1	8	40	44.07	78.23		1	9	13	39.02	-85.21	1	9	5	48.17	175.82
1	10	10	10.69	55.52		1	10	35	37.79	154.43					

TABLE III.- ALTERNATE MISSION 2a DESCRIPTION - Continued
 (b) CSM lighting summary - Concluded

SUNRISE			SUNSET			MOONRISE			MOONSET			REVOLUTION					
D	H	M	S	LONG		D	H	M	S	LONG		D	H	M	S	LONG	
1	11	39	53.30	33.04		1	11	3	13.92	-107.79		1	11	28	21.24	-5.34	
1	13	9	32.79	10.72		1	12	32	50.40	-130.23		1	12	58	10.59	-26.96	
1	14	39	10.52	-11.69		1	14	2	28.65	-152.57		1	14	27	57.10	-48.77	
1	16	8	45.87	-34.22		1	15	32	8.22	-174.83		1	15	57	41.54	-70.72	
1	17	38	17.90	-56.42		1	17	1	39.72	162.49		1	17	27	26.97	-92.60	
1	19	7	53.55	-79.42		1	18	31	13.10	139.91		1	18	57	13.09	-114.43	
1	20	37	36.98	-106.44		1	20	0	57.21	117.98		1	20	29	24.35	-131.51	
1	22	8	44.52	-129.16		1	21	37	0.88	95.09		1	22	0	36.44	-153.97	
1	23	34	47.74	-152.09		1	23	3	7.81	72.39		1	23	31	54.29	-176.10	
2	1	10	50.06	-175.06		2	0	34	8.74	49.98		2	1	3	12.68	161.82	
																	31.74

TABLE III.- ALTERNATE MISSION 2a DESCRIPTION - Continued

(c) Radar acquisition and loss summary for CSM

MSFN STATION	ACQUISITION	LOSS	ELAPSED TIME	MAX ELEVATION	MAX RANGE	MIN RANGE	REVOLUTION NUMBER
NAME	DAY HR MIN SEC	DAY HR MIN SEC	MIN SEC	DEG	N MI	N MI	
HAW (S) USB-3U*	0 2 54 54	0 3 0 43	5 49	17.21	936.10	371.80	2.85
USS HUNTSVILLE	0 2 58 25	0 3 6 26	8 3	54.57	888.37	151.86	2.89
GDS (S) USB-85*	0 3 26	0 3 11 6	7 39	18.70	862.75	340.36	2.97
GYH (S) USB-3U*	0 3 4 28	0 3 12 21	7 52	28.08	889.02	249.93	2.97
WHS-15 (FPP-16H)	1 1 5 23	0 3 13 31	8 9	33.06	776.92	218.41	2.99
TEX (S) USB-3U*	0 3 7 32	0 3 15 25	7 53	19.80	807.81	329.40	3.02
HIL (S) USB-3U*	0 3 11 12	0 3 19 0	7 48	37.04	821.07	204.81	3.05
GBM (S) USB-3U*	0 3 41 55	0 3 19 55	8 0	24.65	782.74	285.70	3.05
BDA (S) USB-3U*	0 3 14 46	0 3 22 17	7 31	16.67	580.05	386.92	3.05
ANG-91 USB-3U	0 3 16 57	0 3 24 13	7 16	12.20	635.41	478.29	3.10
USS VANGUARD	0 3 18 44	0 3 24 34	5 49	4.24	942.36	747.68	3.12
ACN (S) USB-3U*	0 3 30 32	0 3 38 53	8 21	20.13	939.39	361.71	3.24
CRO (S) USB-3U*	0 4 1 51	0 4 10 44	8 53	45.89	963.96	20.06	3.59
GWH (S) USB-3U	0 4 17 45	0 4 18 58	1 12	.52	940.00	940.00	3.67
HAW (S) USB-3U*	0 4 27 42	0 4 35 35	7 52	22.52	613.08	223.64	3.69
USS HUNTSVILLE	0 4 33 38	0 4 41 44	7 26	12.39	801.97	449.79	3.91
GDS (S) USB-85*	0 4 37 52	0 4 45 43	7 51	22.66	841.16	29.99	3.95
GYH (S) USB-3U*	0 4 39 17	0 4 47 21	8 3	20.96	748.09	317.72	3.96
WHS-15 (FPP-16H)	0 4 40 8	0 4 48 9	0 0	44.25	895.50	177.52	3.96
TEX (S) USB-3U*	0 4 42 21	0 4 50 25	8 3	61.57	946.45	145.16	4.02
HIL (S) USB-3U*	0 4 46 0	0 4 53 56	7 56	21.74	885.92	322.44	4.04
GBM (S) USB-3U*	0 4 46 37	0 4 54 42	8 5	27.02	908.85	267.82	4.06
BDA (S) USB-3U*	0 4 51 7	0 4 54 33	3 25	1.64	951.95	676.42	4.06
ANG-91 USB-3U	0 4 51 7	0 4 59 38	8 31	25.05	731.54	290.40	4.06
ACN (S) USB-3U*	0 4 55 9	0 5 13 37	8 28	14.89	817.15	483.99	4.02
CRO (S) USB-3U*	0 5 37 52	0 5 43 32	5 39	4.55	961.53	777.31	4.05
GWH (S) USB-3U*	0 5 48 51	0 5 56 59	8 7	27.22	810.73	266.06	4.06
HAW (S) USB-3U*	0 6 3 24	0 6 9 56	6 32	8.36	770.97	552.86	4.02
USS HUNTSVILLE	0 6 8 44	0 6 16 9	7 24	14.97	632.82	403.24	4.02
GDS (S) USB-85*	0 6 12 34	0 6 19 48	7 14	12.82	685.30	452.64	4.04
GYH (S) USB-3U*	0 6 14 0	0 6 22 10	8 9	44.67	879.54	181.87	4.04
WHS-15 (FPP-16H)	0 6 14 55	0 6 22 12	7 16	12.81	687.90	457.68	4.04
HIL (S) USB-3U*	0 6 22 15	0 6 24 13	3 58	2.09	960.79	661.15	5.00
TEX (S) USB-3U*	0 6 17 5	0 6 24 48	7 43	15.49	892.79	412.11	5.00
GBM (S) USB-3U*	0 6 22 54	0 6 27 9	4 14	2.34	895.71	847.69	5.02
ANG-91 USB-3U	0 6 27 48	0 6 31 54	4 6	2.19	936.40	683.39	5.05
ACN (S) USB-3U*	0 6 43 36	0 6 45 20	1 41	.64	1024.34	1024.34	5.19
USS MERCURY	0 7 22 3	0 7 27 33	5 29	4.73	910.26	702.39	5.62
GWH (S) USB-3U*	0 7 24 15	0 7 31 7	6 52	9.57	932.44	523.08	5.67
HAW (S) USB-3U*	0 7 34 45	0 7 45 11	6 26	7.70	800.66	561.97	5.67

TABLE III.- ALTERNATE MISSION 2a DESCRIPTION - Continued
(c) Radar acquisition and loss summary for CSM - Continued

MSFN STATION	ACQUISITION	LOSS	ELAPSED TIME	MAX ELEVATION	MAX RANGE	MIN RANGE	REVOLUTION NUMBER
NAME	DAY HR MIN SEC	DAY HR MIN SEC	MIN SEC	DEG	N MI	N MI	
GUS (S) USB-85*	0 7 48 49	0 7 51 51	3 2	1.50	874.9 U	5.90	
USS HUNTSVILLE	0 7 43 16	0 7 51 33	8 17	25.019	726.93	5.90	
GYN (S) USB-3U*	0 7 49 19	0 7 55 39	6 14	6.646	639.97	5.94	
USS MERCURY	0 8 55 11	0 9 3 18	8 7	25.074	734.19	6.63	
HAN (S) USB-3U*	0 9 13 7	0 9 21 1	7 53	18.045	833.09	6.64	
USS HUNTSVILLE	0 9 18 14	0 9 25 48	7 34	14.049	934.58	6.66	
USS MERCURY	0 10 30 17	0 10 37 52	7 34	19.036	922.49	7.62	
HAW (S) USB-3U*	0 10 47 43	0 10 55 52	8 9	24.002	834.61	7.62	
USS REEUSIONE	0 11 5 6	0 11 10 0	4 53	2.084	904.77	7.95	
USS MERCURY	0 12 5 27	0 12 12 43	7 15	11.087	870.28	8.64	
HAN (S) USB-3U*	0 12 24 55	0 12 27 23	2 27	1.019	925.15	8.78	
USS REEUSIONE	0 12 37 23	0 12 46 22	8 59	31.017	1065.82	8.97	
ACN (S) USB-3U*	0 13 4 20	0 13 11 47	7 47	1.090	749.46	556.32	9.23
USS MERCURY	0 13 40 12	0 13 48 5	7 53	26.073	912.20	265.59	9.62
GWM (S) USB-3U*	0 13 46 19	0 13 53 23	7 4	10.001	946.76	537.45	9.68
USS REEUSIONE	0 14 12 7	0 14 21 15	9 7	32.059	1025.63	288.17	9.94
ACN (S) USB-3U*	0 14 36 33	0 14 46 58	8 25	29.91	293.30	293.30	
USS MERCURY	0 15 14 45	0 15 22 51	8 6	26.059	874.64	556.32	9.23
GWM (S) USB-3U*	0 15 20 24	0 15 28 46	8 21	39.078	912.20	265.59	9.62
USS REDSTONE	0 15 47 23	0 15 56 3	8 40	17.017	899.25	462.83	10.95
CYI (S) USB-3U*	0 16 21 46	0 16 22 44	0 58	0.42	920.79	920.79	11.622
USS MERCURY	0 16 51 19	0 16 55 2	3 43	1.068	908.87	879.63	11.658
GWM (S) USB-3U*	0 16 57 31	0 17 17 51	3 13	1.019	970.04	934.63	11.643
USS REDSTONE	0 17 22 26	0 17 31 20	8 54	23.054	854.51	365.27	10.67
CYI (S) USB-3U*	0 17 52 37	0 18 0 12	7 34	19.024	601.47	335.61	12.23
MAD (S) USB-85*	0 17 58 7	0 18 1 43	3 35	1.093	903.33	818.58	12.25
CNB (S) USB-85*	0 18 38 29	0 18 43 57	5 27	3.047	887.68	868.39	12.69
USS REDSTONE	0 18 57 27	0 19 19 50	9 23	42.092	814.92	221.59	12.94
ANG-91 USB-3U	0 19 15 58	0 19 23 34	7 35	15.010	902.33	411.37	13.011
USS VANGUARD	0 19 22 47	0 19 26 39	3 51	2.018	894.34	816.43	13.015
CYI (S) USB-3U*	0 19 26 58	0 19 35 2	8 3	31.042	790.55	226.16	13.024
MAD (S) USB-85*	0 19 35 0	0 19 37 10	4 16	7.54	789.50	579.28	13.027
CNO (S) USB-3U	0 20 3 11	0 20 10 42	7 31	9.04	995.79	610.29	13.061
CNB (S) USB-85*	0 20 11 8	0 20 19 43	8 34	15.027	837.70	497.12	13.070
USS REDSTONE	0 20 32 53	0 20 39 20	6 26	6.055	852.96	700.89	13.092
MIL (S) USB-3U	0 20 50 3	0 20 53 18	3 14	1.044	919.57	860.92	14.005
GBM (S) USB-3U*	0 20 49 14	0 20 54 47	5 32	4.97	870.47	691.86	14.007
ANG-91 USB-3U	0 20 50 0	0 20 58 12	7 42	22.005	572.45	304.91	14.009
BDA (S) USB-30*	0 20 52 34	0 20 58 21	5 47	5.013	926.51	675.59	14.011
USS VANGUARD	0 20 55 4	0 21 2 37	7 30	16.024	875.10	376.40	14.014
CYI (S) USB-3U*	0 21 2 1	0 21 9 48	7 46	22.060	870.86	294.02	14.024
MAD (S) USB-85*	0 21 5 0	0 21 11 21	6 20	7.00	767.97	574.12	14.026
CNO (S) USB-3U	0 21 36 48	0 21 46 4	9 14	35.006	725.66	269.40	14.040
CNB (S) USB-85*	0 21 45 17	0 21 54 20	9 2	29.008	1066.76	307.83	14.072
TEX (S) USB-3U	0 22 19 29	0 22 25 28	5 58	6.023	819.76	640.87	15.001
MIL (S) USB-3U	0 22 22 14	0 22 29 54	7 40	21.080	925.40	304.63	15.006
GBM (S) USB-30*	0 22 22 24	0 22 30 16	7 53	46.004	516.10	170.11	15.005
ANG-91 USB-3U	0 22 27 4	0 22 31 44	7 49	2.099	783.04	764.92	15.008
BOA (S) USB-3U	0 22 53	0 22 33 43	7 49	24.011	848.36	279.05	15.010

TABLE III.- ALTERNATE MISSION 2a DESCRIPTION - Continued

(c) Radar acquisition and loss summary for CSM - Continued

MSFN STATION NAME	ACQUISITION			LOSS			ELAPSED TIME			MAX ELEVATION		MAX RANGE		MIN RANGE		REVOLUTION NUMBER	
	DAY	HR	MIN	SEC	DAY	HR	MIN	SEC	MIN	SEC	DEG	N MI	N MI	N MI	N MI	N MI	N MI
USS VANGUARD	0	22	29	21	0	22	37	26	8	4	25° 6.2	733.48	265.98	15° 15.1			
MAD (S) USB-85*	0	22	40	11	0	22	44	14	4	3	20° 3.4	915.95	809.06	15° 22.2			
CYI (S) USB-30*	0	22	36	41	0	22	44	46	6	4	41° 1.5	861.06	185.97	15° 24.1			
CRO (S) USB-30*	0	23	11	54	0	23	20	46	6	51	22° 7.7	992.72	378.96	15° 6.1			
CNB (S) USB-85*	0	23	19	57	0	23	28	43	8	46	23° 8.8	1001.79	361.06	15° 7.0			
GYH (S) USB-30*	0	23	50	27	0	23	57	44	7	17	13° 9.1	669.72	422.80	15° 9.7			
NHS-15 (FPP-16M)	0	23	52	14	0	23	58	40	6	25	7° 8.9	924.58	573.52	15° 9.9			
TEX (S) USB-30*	0	23	52	49	1	0	0	52	6	3	35° 4.5	821.29	207.35	16° 0.2			
MIL (S) USB-30*	0	23	56	37	1	0	4	35	7	58	49° 6.5	877.58	172.08	16° 0.7			
GBW (S) USB-30*	0	23	57	10	1	0	4	51	7	50	20° 1.5	796.87	320.29	16° 0.9			
ANG-91 (S) USB-30	1	0	4	11	0	4	54	0	42	• 0.19	915.00	915.00	16° 0.7				
BDA (S) USB-30*	1	0	4	23	1	0	8	17	7	54	72° 2.8	488.11	128.94	16° 0.9			
USS VANGUARD	1	0	4	1	0	12	1	7	59	42° 1.7	870.16	181.33	16° 1.4				
CYI (S) USB-30*	1	1	25	25	1	1	0	19	16	7	15° 7.8	782.28	395.94	16° 2.2			
CRO (S) USB-30*	1	0	47	7	1	0	55	48	8	41	16° 1.7	847.78	478.93	16° 6.0			
CNB (S) USB-85*	1	0	55	6	1	1	2	6	0	7	7° 9.0	868.63	680.57	16° 6.4			
HAW (S) USB-30*	1	1	37	55	1	1	19	20	3	43	1° 7.2	884.56	655.50	16° 8.3			
USS HUNTSVILLE	1	1	18	55	1	1	26	37	7	42	18° 9.0	878.08	344.60	16° 9.1			
GDS (S) USB-85*	1	23	24	24	1	23	31	14	7	50	9° 8.2	848.91	510.79	16° 9.6			
GYH (S) USB-30*	1	23	56	44	1	23	32	33	8	36	58° 1.7	883.95	444.29	16° 9.9			
WHS-15 (FPP-16M)	1	25	44	39	1	25	33	47	8	3	29° 3.7	845.59	237.15	16° 9.9			
TEX (S) USB-30*	1	1	27	39	1	1	35	34	7	54	22° 7.3	801.46	291.62	17° 0.1			
MIL (S) USB-30*	1	1	31	30	1	1	39	27	7	56	21° 2.8	767.93	308.40	17° 0.6			
GBW (S) USB-30*	1	1	32	20	1	1	31	39	7	34	19° 0.7	624.80	333.42	17° 0.6			
BDA (S) USB-30*	1	1	34	54	1	1	42	57	8	2	31° 1.1	820.42	230.02	17° 1.0			
ANG-91 (S) USB-30	1	1	38	5	1	1	42	53	4	47	3° 4.0	897.76	753.81	17° 1.0			
USS VANGUARD	1	1	38	45	1	1	46	8	7	23	1° 6.8	636.48	408.05	17° 1.3			
CYI (S) USB-30*	1	1	48	12	1	1	50	51	2	39	0.76	949.57	925.35	17° 1.8			
ACN (S) USB-30*	1	1	53	25	1	1	56	40	3	15	1° 3.2	962.55	911.61	17° 2.2			
CRO (S) USB-30*	1	2	22	1	1	2	30	52	8	50	33° 8.8	1057.34	465.80	17° 5.8			
HAW (S) USB-30	1	2	47	47	1	2	55	36	7	49	27° 4.5	829.23	243.65	17° 6.8			
USS HUNTSVILLE	1	2	53	16	1	3	1	15	7	59	34° 0.1	942.83	219.05	17° 7.1			
GDS (S) USB-85*	1	2	57	55	1	3	6	11	8	16	20° 8.4	793.86	338.61	17° 9.6			
GYH (S) USB-30*	1	2	59	9	1	3	7	28	8	19	29° 4.9	953.79	268.30	17° 9.9			
GYN (S) USB-30*	1	2	59	9	1	3	8	39	8	19	29° 4.9	873.71	266.30	17° 9.9			
WHS-15 (FPP-16M)	1	2	59	56	1	3	10	45	8	41	24° 5.1	785.84	230.30	18° 0.1			
TEX (S) USB-30*	1	3	2	4	1	3	19	23	5	21	3° 4.2	1082.81	921.58	18° 0.1			
HIL (S) USB-30*	1	3	5	37	1	3	14	48	9	11	32° 2.8	717.67	275.63	18° 0.6			
ACN (S) USB-30*	1	3	57	35	1	3	15	30	9	11	53° 3.7	1015.65	196.80	18° 0.7			
GBW (S) USB-30*	1	3	57	35	1	3	17	30	8	17	44° 5.9	1031.54	516.18	18° 0.7			
BDA (S) USB-30*	1	3	59	7	1	4	30	52	5	22	4° 5.1	872.12	712.75	18° 0.7			
ANG-91 (S) USB-30	1	3	59	9	1	3	20	15	8	19	1° 0.8	799.95	354.61	18° 1.1			
USS VANGUARD	1	3	11	6	1	3	19	23	9	19	26° 3.8	857.11	420.07	18° 1.1			
USS HUNTSVILLE	1	4	29	27	1	4	36	15	4	47	12° 1.5	765.10	295.03	18° 1.5			
GDS (S) USB-85*	1	4	33	27	1	4	40	42	7	15	21° 3.2	870.94	192.68	18° 1.7			
GYH (S) USB-30*	1	4	34	58	1	4	42	31	7	33	35° 2.8	870.94	192.68	18° 1.9			
WHS-15 (FPP-16M)	1	4	35	43	1	4	44	44	4	43	7° 3.1	229.43					

TABLE III.- ALTERNATE MISSION 2a DESCRIPTION - Continued
(c) Radar acquisition and loss summary for CSM - Continued

MSFN STATION	ACQUISITION	LOSS	ELAPSED TIME	MAX ELEVATION	MAX RANGE	MIN RANGE	N MI	N MI	NUMBER				
NAME	DAY	HR	MIN	SEC	DAY	HR	MIN	SEC	MIN SEC	DEG	MAX	MIN	REVOLUTION
TEX (S) USB-3U*	1	4	47	54	1	4	45	34	7	40	49-39	859-47	151-42
HIL (S) USB-3U*	1	4	41	46	1	4	48	37	6	50	11-99	845-47	442-84
GBM (S) USB-3U*	1	4	42	23	1	4	49	26	7	3	13-94	852-99	404-91
ANG-91 USB-3U	1	4	46	57	1	4	54	19	7	42	16-08	916-66	379-60
ACN (S) USB-3U*	1	5	1	13	1	5	8	6	6	53	8-54	996-76	614-86
CRO (S) USB-3U*	1	5	34	49	1	5	36	1	1	49	4-43	983-36	971-40
GFM (S) USB-3U*	1	5	43	52	1	5	52	0	8	8	7-26	938-86	132-82
HAN (S) USB-3U*	1	5	58	50	1	6	4	58	6	7	7-16	919-44	585-71
USS HUNTSVILLE	1	6	3	57	1	6	11	18	7	21	17-53	928-49	352-52
GDS (S) USB-85*	1	6	7	54	1	6	14	18	6	23	8-47	933-85	550-63
WHS-15 (FP5-16M)	1	6	10	24	1	6	16	37	6	13	7-47	941-83	587-29
GYM (S) USB-3U*	1	6	9	15	1	6	16	54	7	39	25-87	944-54	267-22
TEX (S) USB-3U*	1	6	12	36	1	6	19	11	6	34	8-97	950-42	548-10
USS MERCURY	1	7	16	12	1	7	23	10	6	57	10-31	750-01	513-29
GFM (S) USB-3U*	1	7	19	49	1	7	25	35	5	46	5-20	905-65	677-01
HAW (S) USB-3U*	1	7	33	45	1	7	40	21	6	36	7-70	881-25	569-25
USS HUNTSVILLE	1	7	36	14	1	7	46	21	8	2	65-75	895-09	135-84
GYM (S) USB-3U*	1	7	45	20	1	7	49	11	3	51	1-89	859-98	843-40
USS MERCURY	1	8	50	6	1	8	58	2	7	56	67-64	490-89	134-23
HAW (S) USB-3U*	1	9	8	2	1	9	15	54	3	51	35-51	913-19	206-39
USS HUNTSVILLE	1	9	13	31	1	9	19	50	6	19	7-00	844-73	614-50
USS MERCURY	1	10	25	7	1	10	32	30	7	23	13-60	846-03	420-42
HAW (S) USB-3U*	1	10	42	43	1	10	50	0	7	17	13-39	682-43	438-25
USS HEUSTONE	1	10	58	44	1	11	5	23	6	39	7-29	833-05	673-12
ACN (S) USB-3U*	1	11	26	3	1	11	28	53	2	50	0-95	1040-57	982-10
USS MERCURY	1	12	0	12	1	12	7	27	7	14	13-98	671-05	410-68
GFM (S) USB-3U*	1	12	7	54	1	12	10	38	2	44	0-83	904-64	880-24
USS HEUSTONE	1	12	31	56	1	12	40	55	8	59	59-71	992-24	176-63
ACN (S) USB-3U*	1	12	58	23	1	13	6	44	8	20	19-36	877-77	389-67
USS MERCURY	1	13	34	36	1	13	42	38	8	0	34-49	836-97	209-26
GFM (S) USB-3U*	1	13	40	29	1	13	48	5	7	35	18-04	619-06	355-92
USS HEUSTONE	1	14	6	41	1	14	15	32	8	50	19-24	775-93	413-92
CYI (S) USB-3U*	1	17	16	33	1	14	41	0	7	52	12-85	835-80	485-06
USS HEUSTONE	1	17	37	53	1	15	16	46	7	24	12-14	824-19	459-55
ANG-91 USB-3U	1	17	46	28	1	17	54	25	7	57	30-62	863-47	235-36
CYI (S) USB-3U	1	17	51	26	1	17	56	22	4	55	3-84	867-34	417-20
MAD (S) USB-85*	1	17	51	26	1	16	50	21	8	28	17-93	1019-56	440-30
CNB (S) USB-3U*	1	18	31	48	1	16	18	49	5	8	4-08	889-47	738-42
USS HEUSTONE	1	18	51	13	1	17	25	34	9	2	24-23	740-87	352-16
ANG-91 USB-3U	1	19	9	36	1	19	17	46	8	46	28-80	883-02	299-05
USS VANGUARD	1	19	15	37	1	19	21	22	5	45	32-84	963-95	231-59
CYI (S) USB-3U*	1	19	21	3	1	19	29	1	7	58	30-62	876-71	669-81
MAD (S) USB-85*	1	19	24	40	1	19	31	4	6	24	21-15	738-20	308-50
CRO (S) USB-3U*	1	19	56	46	1	20	5	16	8	30	16-73	755-79	551-34
CNB (S) USB-85*	1	20	4	32	1	20	14	49	10	16	28-46	462-21	28-71

TABLE III.- ALTERNATE MISSION 2a DESCRIPTION - Concluded
 (c) Radar acquisition and loss summary for CSM - Concluded

MSFN STATION	ACQUISITION	LOSS	DAY	HR	MIN	SEC	MIN	SEC	MAX ELEVATION	MAX RANGE	MJN RANGE	N MI	N MI	REVOLUTION NUMBER	
USS REVESTONE	20	24	1	20	45	53	9	6	8°9'	1329°25'	940°78	28°93	29°01		
TEX (S) USB-30*	20	41	13	1	20	51	21	4	40	1259°29'	1131°02	1131°02	29°05		
MIL (S) USB-30*	20	42	51	1	20	51	22	8	31	1161°67	1131°29	1131°29	29°08		
GBM (S) USB-30*	20	42	43	1	20	52	5	9	21	1174°3	1131°29	1131°29	29°10		
BDA (S) USB-30*	20	46	34	1	20	55	14	6	40	1156°1	1040°61	1040°61	29°15		
ANG-91 USB-3U	20	45	26	1	20	54	35	9	7	1164°3	1138°59	1138°59	29°10		
USS VANGUARD	20	50	2	1	20	58	56	8	54	1279°9	1153°02	1153°02	29°15		
CYI (S) USB-30*	20	57	53	1	21	5	25	7	31	2116°6	1846°44	1846°44	29°25		
MAD (S) USB-85*	21	1	8	1	21	6	22	5	14	1408°8	1071°12	1071°12	29°25		
CRO (S) USB-3U	21	32	8	1	21	42	14	10	6	43°78	1081°09	1081°09	29°64		
CBN (S) USB-85*	21	40	5	1	21	51	17	11	12	42°72	1171°52	1171°52	29°71		
GYM (S) USB-30*	22	12	45	1	22	20	26	7	42	7°12	1182°31	1182°31	29°98		
WHS-15 (FP5-16H)	22	15	0	1	22	21	15	6	14	4°05	1103°4	1103°4	29°98		
TEX (S) USB-30*	22	14	38	1	22	24	3	9	24	19°50	1190°25	1190°25	30°02		
MIL (S) USB-30*	22	18	17	1	22	27	46	9	28	51°35	1198°80	1198°80	30°07		
GBM (S) USB-30*	22	18	41	1	22	28	12	9	31	58°21	1036°50	1036°50	30°07		
BDA (S) USB-30*	22	22	27	1	22	31	14	8	47	45°64	914°98	914°98	30°10		
ANG-91 USB-30*	22	24	17	1	22	29	25	5	7	3°31	970°21	970°21	30°10		
USS VANGUARD	22	26	26	1	22	34	43	8	16	41°07	830°45	830°45	30°15		
CYI (S) USB-10*	22	34	21	1	22	41	28	7	7	28°02	783°65	783°65	30°24		
CRO (S) USB-30*	23	8	30	1	23	19	0	10	29	25°68	1014°47	1014°47	30°41		
CBN (S) USB-85*	23	16	3	1	23	27	22	11	18	28°56	1030°49	1030°49	30°69		
USS HUNTSVILLE	23	42	23	1	23	51	1	8	38	1010	1123°15	1123°15	30°91		
GDS (S) USB-85*	23	48	28	1	23	55	33	7	5	6°36	1053°17	1053°17	30°97		
GYM (S) USB-30*	23	47	40	1	23	57	15	9	35	31°61	850°73	850°73	30°97		
WHS-15 (FP5-16H)	23	49	26	1	23	58	19	8	53	18°13	848°40	848°40	31°34		
TEX (S) USB-30*	23	50	44	2	0	0	5	21	59°10	1029°38	1029°38	31°02			
MIL (S) USB-30*	23	55	3	2	0	3	29	8	25	38°30	1011°31	1011°31	31°05		
GBM (S) USB-30*	23	55	43	2	0	3	53	8	9	19°84	821°13	821°13	31°07		
ANG-91 USB-3U	23	0	3	17	2	0	3	44	0	27	°15	906°83	906°83	31°07	
BDA (S) USB-30*	23	59	0	2	0	7	1	8	0	66°94	922°45	922°45	31°10		
USS VANGUARD	2	0	2	59	2	0	10	18	7	23°98	842°75	842°75	31°11		
CYI (S) USB-30*	2	11	14	2	0	14	34	5	19	6°24	776°15	776°15	31°20		
CRO (S) USB-30*	2	0	44	50	2	0	56	10	1	27°36	1231°03	1231°03	31°62		
CBN (S) USB-85*	2	0	52	41	2	1	20	9	38	10°98	1230°59	1230°59	31°66		
HAW (S) USB-30*	2	12	25	2	1	21	44	9	19	15°25	1305°50	1305°50	31°84		
USS HUNTSVILLE	2	17	44	2	1	27	9	9	24	56°34	1203°56	1203°56	31°86		
GDS (S) USB-85*	2	23	50	2	1	31	4	7	14	15°08	1056°08	1056°08	31°94		
GYM (S) USB-30*	2	24	35	2	1	32	6	7	32	38°18	1017°11	1017°11	31°96		
WHS-15 (FP5-16H)	2	57	2	1	33	6	7	9	47°25	974°53	974°53	31°97			

TABLE IV.- ALTERNATE MISSION 2b DESCRIPTION

(a) Maneuver Plan

Event	Rev no	g.e.t., day:hr:min	Burn time sec	ΔV , ips			IMU Alignment	Resultant Ellipse a/h_p , n. mi.	TVC Mode		Station Contact	Comments
				Total	ΔV_x	ΔV_y			primary	secondary		
Orbit insertion COI	1		10.6				Launch	124/126	SCS	MTVC	ETR	SPS contingency orbit insertion
First SPS burn	16	00:23:03	20.1	420	-54	417	0	Preferred	94/124	GNCS	SCS	CRO
Second SPS burn	19	01:02:53	57.6	1299	175	1267	230	Preferred	91/240	GNCS /MTVC	SCS	MIL
Third SPS burn	29	01:19:49	0.5	15	15	0	0	Deorbit	93/241	GNCS	None	CRO
Fourth SPS burn	32	02:01:07	11.3	282	-177	0	219	Deorbit		GNCS	SCS	HAW
												Deorbit burn $t_{ff} = 16$ min

TABLE IV.- ALTERNATE MISSION 2b DESCRIPTION - Continued
 (b) CSM lighting summary

ASSUMED LIFTOFF TIME = YEAR 1968			MONTH 8			DAY 1			HR 0			MIN 0			SEC .00)		
START IN LIGHT AT T = DAY 0			HR 0			MIN 12			SEC 11.68			SUN-LIGHT, EARTH-SHIELD					
START IN LIGHT AT T = DAY 0			HR 0			MIN 12			SEC 11.68			MOON-LIGHT, EARTH-SHIELD					
SUNRISE			SUNSET			MOONRISE			MOONSET			REVOLUTION					
D H M	S	LONG	D H M	S	LONG	D H M	S	LONG	D H M	S	LONG	D H M	S	LONG	D H M	S	LONG
0 1 16	21.87	-168.24	0 0 39	37.86	48.02	0	1 37	17.54	+92.20	0	1 0	5.58	131.33	2.36	2.59	2.77	2.98
0 2 45	23.68	169.76	0 2 8	35.64	25.83	0	3 6	18.13	+114.03	0	2 29	6.83	109.53	3.54	3.70	3.83	3.93
0 4 14	12.25	147.08	0 3 37	28.26	3.36	0	4 35	31.61	+134.84	0	3 58	19.59	88.63	4.24	4.49	4.63	4.86
0 5 43	14.75	125.15	0 5 6	27.80	+16.71	0	6 35	17.64	+41.28	0	6 56	29.08	45.67	5.17	5.42	5.58	5.81
0 7 12	4.25	102.56	0			0	7 33	43.55	+177.51	0	8 27	18.95	66.73	6.12	6.37	6.51	6.74
0 8 41	4.01	80.53	0	8 4	18.84	-43.22	0	9 2 50.16	161.25	0	9 54	37.59	2.71	7.07	7.30	7.46	7.69
0 10 9	54.85	58.04	0	9 33	6.16	-85.87	0	10 31 53.65	139.81	0	9 25	30.19	23.94	8.00	8.25	8.51	8.74
0 11 38	51.14	35.87	0	11 2	5.23	+107.89	0	12 1 1.98	118.76	0	11 23	40.39	+18.84	9.18	9.34	9.57	9.87
0 13 7	43.91	13.53								0	12 52	45.05	-40.23	10.13	10.27		

TABLE IV.- ALTERNATE MISSION 2b DESCRIPTION - Continued
 (b) CSM lighting summary - Continued

SUNRISE			SUNSET			MOONRISE			MOONSET			REVOLUTION			
D	H	M	S	LONG		D	H	M	S	LONG	D	H	M	S	LONG
0	13	59	48.29	-152.65		0	13	30	2.10	47.12	0	14	21	49.41	-61.63
0	14	36	35.69	-8.84		0	14	59	11.61	76.22	0	15	50	51.36	-63.18
0	16	5	31.18	-31.00		0	16	57	31.14	162.66	0	17	19	57.06	-104.44
0	17	34	16.95	-53.65		0	18	26	27.39	140.61	0	18	48	56.46	-126.14
0	19	3	16.33	-75.56		0	19	55	13.84	118.05	0	20	18	3.15	*147.29
0	20	32	2.88	-98.13		0	21	24	12.24	96.16	0	21	47	2.28	-169.11
0	22	0	58.87	-120.18		0	22	52	56.40	73.52	0	23	15	58.89	169.42
0	23	30	2.93	-141.12		1	0	21	14.72	51.67	1	0	44	28.02	148.07
1	0	58	21.58	-163.28		1	1	49	29.14	29.34	1	1	22	7.50	-70.35
1	2	26	37.99	174.49		1	3	18	20.68	8.40	1	2	50	26.89	-92.2U
1	3	55	3.44	146.08		1	4	48	46.05	-14.45	1	4	21	10.02	-113.7U
1	5	25	30.47	123.3U		1	6	19	13.65	-37.15	1	5	51	44.95	-135.74
1	6	55	55.15	100.43		1	7	49	44.53	-59.65	1	7	22	26.72	-157.26
1	8	26	25.63	77.88		1	8	15	52.31	44.98	1	8	15	52.31	44.98

TABLE IV.- ALTERNATE MISSION 2b DESCRIPTION - Continued

(b) CSM lighting summary - Concluded

D H M S	LONG	SUNRISE			SUNSET			MOONRISE			MOONSET			REVOLUTION		
		D	H	M	S	LONG	D	H	M	S	LONG	D	H	M		
1 9 56 54.55	55.28	1	9	20	12.13	-82.28	1	8	53	8.48	-178.75	1	9	46	28.16	22.81
1 11 27 20.41	32.55	1	10	50	34.85	-105.16	1	10	23	42.33	159.23	1	11	17	4.40	.70
1 12 57 43.95	9.73	1	12	20	59.10	-127.92	1	11	54	20.82	137.57	1	12	47	44.68	+21.13
1 14 28 8.13	-13.03	1	13	51	25.52	-150.53	1	13	25	2.39	116.15	1	14	18	20.97	-43.19
1 15 58 36.63	-35.54	1	15	21	55.09	-172.94	1	14	55	35.83	94.20	1	15	48	54.95	-65.36
1 17 29 1.95	-58.18	1	16	52	16.98	164.27	1	16	26	8.37	72.22	1	17	19	32.27	-87.29
1 18 59 24.63	-80.92	1	18	22	37.66	141.44	1	17	56	51.25	50.97	1	18	50	10.00	-109.18
1 20 29 41.13	-104.15	1	19	53	.12	118.74	1	19	27	25.07	29.13	1	20	20	46.96	+131.22
1 22 0 18.19	-126.64	1	21	23	38.21	96.36	1	20	58	1.88	6.84	1	21	51	35.30	-153.05
1 23 30 51.14	-149.33	1	22	54	6.47	73.46	1	22	28	50.32	+14.67	1	23	22	16.11	-175.30
2 1 1 20.59	-172.16	2	0	24	35.05	50.40	1	23	59	28.58	-36.81	2	0	52	58.70	162.57
2 1 1 17.16	-172.33	2	1	1	26.74	-171.86						32.08	31.82	32.12	32.38	
2 1 1 17.16	-172.33	2	1	1	26.74	-171.86						31.44	31.75	32.68	32.75	
												30.80	30.80	30.88	30.88	
												31.02	31.02	31.19	31.19	
												32.07	32.07	32.07	32.07	
												32.74	32.74	32.74	32.74	
												32.75	32.75	32.75	32.75	

TABLE IV.- ALTERNATE MISSION 2b DESCRIPTION - Continued
 (c) Radar acquisition and loss summary for CSM

NSFN STATION	ACQUISITION			LOSS	ELAPSED TIME	MAX ELEVATION	MAX RANGE	MIN RANGE	REVOLUTION NUMBER	
	NAME	DAY	HR	MIN	SEC	DAY	HR	MIN	SEC	MIN
BDA (S) USB-30*	U	0	12	10	0	0	13	38	1	27
USS VANGUARD	O	0	12	10	0	0	17	17	5	6
CYI (S) USB-30*	O	0	16	40	0	0	24	28	7	48
CRO (S) USB-30*	O	0	52	32	0	0	59	45	7	12
CNB (S) USB-85*	O	1	0	15	0	1	6	42	6	27
USS HUNTSVILLE	O	1	24	1	0	1	30	44	6	43
GDS (S) USB-85*	O	1	29	28	0	1	35	23	5	55
GYM (S) USB-30*	O	1	29	1	0	1	37	3	8	1
WHS-15 (FPS-16M)	O	1	30	30	0	1	38	6	7	36
TEX (S) USB-30*	O	1	32	5	0	1	39	57	7	51
MIL (S) USB-30*	O	1	35	58	0	1	43	47	7	48
GBM (S) USB-30*	O	1	36	37	0	1	44	7	7	39
BDA (S) USB-30*	O	1	39	23	0	1	47	25	8	1
ANG-91 USB-30	O	1	43	10	0	1	46	22	3	12
USS VANGUARD	O	1	43	7	0	1	50	43	7	36
CYI (S) USB-30*	O	1	51	40	0	1	56	34	4	54
CRO (S) USB-30*	O	2	26	29	0	2	34	9	7	39
HAW (S) USB-30*	O	2	51	59	0	2	59	17	7	18
USS HUNTSVILLE	O	2	56	59	0	3	5	2	8	2
GDS (S) USB-85*	O	3	2	9	0	3	9	40	7	30
GYM (S) USB-30*	O	3	3	0	0	3	10	51	7	51
WHS-15 (FPS-16M)	O	3	4	6	0	3	12	0	7	53
TEX (S) USB-30*	O	3	6	15	0	3	13	54	7	38
MIL (S) USB-30*	O	3	9	54	0	3	17	50	7	56
GBM (S) USB-30*	O	3	10	34	0	3	18	21	7	46
BDA (S) USB-30*	O	3	13	22	0	3	20	41	7	19
ANG-91 USB-30	O	3	15	40	0	3	22	29	6	48
USS VANGUARD	O	3	17	58	0	3	22	44	4	45
ACN (S) USB-30*	O	3	29	25	0	3	36	41	7	16
CRO (S) USB-30*	O	4	0	18	0	4	8	9	5	50
HAW (S) USB-30*	O	4	25	27	0	4	33	16	7	49
USS HUNTSVILLE	O	4	31	21	0	4	38	43	7	21
GDS (S) USB-85*	O	4	35	36	0	4	43	21	7	44
GYM (S) USB-30*	O	4	37	3	0	4	44	55	7	51
WHS-15 (FPS-16M)	O	4	37	53	0	4	45	47	7	53
TEX (S) USB-30*	O	4	40	8	0	4	48	0	7	52
MIL (S) USB-30*	O	4	43	49	0	4	51	26	7	36
GBM (S) USB-30*	O	4	44	28	0	4	52	7	7	39
BDA (S) USB-30*	O	4	49	19	0	4	51	26	2	7
ANG-91 USB-30	O	4	49	49	0	4	56	55	7	54

TABLE IV.- ALTERNATE MISSION 2b DESCRIPTION - Continued
 (c) Radar acquisition and loss summary for CSM - Continued

MSFN STATION	ACQUISITION	LOSS			ELAPSED TIME			MAX ELEVATION			MIN RANGE			REVOLUTION NUMBER	
		DAY	HR	MIN	SEC	DAY	HR	MIN	SEC	MIN	SEC	DEG	N MI	N MI	NUMBER
ACN (S) USB-30*	0 5 3 11	0	5	10	23	7	11	13*24		893*08		420*28	5*23		
CRO (S) USB-30*	0 5 35 27	0	5	40	4	4	36	3*19		822*01		748*77	5*54		
GWH (S) USB-30*	0 5 46 1	0	5	53	45	7	44	27*23		874*33		247*83	5*67		
HAW (S) USB-30*	0 6 0 18	0	6	4	45	6	27	7*70		832*47		567*16	5*84		
USS HUNTSVILLE	0 6 5 39	0	6	12	54	7	14	11*46		815*20		462*67	5*91		
GDS (S) USB-85*	0 6 9 29	0	6	16	28	6	58	10*95		874*57		472*99	5*95		
GTH (S) USB-30*	0 6 10 53	0	6	18	50	7	57	32*77		799*76		214*23	5*97		
WHS-15 (FPS-16H)	0 6 11 55	0	6	18	53	6	57	10*58		862*03		479*70	5*97		
TEX (S) USB-30*	0 6 14 9	0	6	21	25	7	16	15*01		902*72		386*51	5*99		
MIL (S) USB-30*	0 6 19 36	0	6	22	31	2	55	1*01		880*91		855*53	6*01		
GBH (S) USB-30*	0 6 20 0	0	6	23	23	3	22	1*69		886*29		816*55	6*01		
ANG-91 USB-30	0 6 22 22	0	6	27	51	2	29	1*11		847*27		847*27	6*05		
USS MERCURY	0 7 18 28	0	7	23	17	4	49	3*49		783*07		730*48	6*62		
GWH (S) USB-30*	0 7 20 16	0	7	27	7	6	48	10*06		764*21		496*14	6*67		
HAW (S) USB-30*	0 7 34 48	0	7	41	1	6	12	7*18		791*07		563*20	6*84		
GDS (S) USB-85*	0 7 45 11	0	7	47	22	2	10	1*08		850*38		850*38	6*90		
USS HUNTSVILLE	0 7 39 22	0	7	47	19	7	57	24*36		748*67		270*60	6*90		
GTH (S) USB-30*	0 7 45 29	0	7	51	20	5	51	6*27		796*94		612*58	6*94		
USS MERCURY	0 8 50 28	0	8	58	14	7	48	44*84		915*23		168*14	7*64		
HAW (S) USB-30*	0 8 9 8	0	8	25	0	9	52	7	27	18*63		589*10	7*83		
USS HUNTSVILLE	0 9 13 26	0	9	20	34	7	10	12*41		841*72		436*55	7*89		
USS MERCURY	0 10 24 29	0	10	32	3	7	33	20*75		565*74		308*06	8*62		
HAW (S) USB-30*	0 10 42 11	0	10	49	50	7	38	28*33		903*93		236*73	8*82		
USS REDSTONE	0 11 2 11	0	11	2	15	0	3	*02		913*15		913*75	8*94		
USS MERCURY	0 11 58 51	0	12	5	59	7	7	12*81		667*89		431*64	9*62		
HAW (S) USB-30*	0 12 18 43	0	12	20	26	1	42	0*31		888*01		888*01	9*78		
USS REDSTONE	0 12 31 8	0	12	38	47	7	39	18*70		817*04		331*84	9*94		
ACN (S) USB-30*	0 12 57 40	0	13	3	44	6	4	6*59		827*24		404*82	10*23		
USS MERCURY	0 13 32 43	0	13	40	20	7	36	22*49		898*15		287*74	10*66		
GWH (S) USB-30*	0 13 39 4	0	13	45	22	6	17	7*80		728*37		557*67	10*66		
USS REDSTONE	0 14 4 48	0	14	12	37	7	49	25*96		851*80		260*16	10*92		
ACN (S) USB-30*	0 14 30 35	0	14	38	23	3	35	38*56		885*65		187*02	11*23		
USS MERCURY	0 15 4 30	0	15	14	11	7	41	32*57		546*09		212*65	11*61		
GWH (S) USB-30*	0 15 12 14	0	15	19	59	7	44	49*00		528*29		154*52	11*66		
USS REDSTONE	0 15 39 12	0	15	46	24	7	14	12*40		898*27		445*24	11*96		
ACN (S) USB-30*	0 16 7 57	0	16	8	30	0	32	*24		896*58		896*58	12*18		
USS MERCURY	0 16 41 58	0	16	45	33	3	35	1*94		875*3		798*61	12*57		
GWH (S) USB-30*	0 16 48 13	0	16	50	53	2	39	*92		905*80		852*77	12*63		
USS REDSTONE	0 17 13 12	0	17	20	45	7	32	15*36		829*30		387*23	12*96		
CYI (S) USB-30*	0 17 42 42	0	17	49	56	7	14	15*16		621*00		383*25	13*23		
HAD (S) USB-95*	0 17 48 46	0	17	51	4	2	17	1*04		854*17		854*17	13*25		
CNB (S) USB-85*	0 18 30 3	0	18	30	50	0	46	*24		898*49		898*49	13*67		
USS REDSTONE	0 18 46 51	0	18	54	53	8	1	35*93		791*05		200*56	13*95		
ANG-91 USB-30	0 19 5 22	0	19	12	9	6	47	10*38		755*78		482*93	14*10		
CYI (S) VANGUARD	0 19 13 7	0	19	14	39	1	31	*55		881*13		881*13	14*46		
HAD (S) USB-30*	0 19 16 4	0	19	23	56	2	52	52*09		881*73		150*42	14*23		
CYI (S) USB-30*	0 19 20 2	0	19	26	2	5	59	6*14		880*67		617*88	14*26		
CRO (S) USB-30*	0 19 52 59	0	19	58	22	5	22	4*69		894*73		673*30	14*66		
CNB (S) USB-85*	0 20 0 36	0	20	7	28	6	52	11*08		702*26		470*42	14*70		

TABLE IV.- ALTERNATE MISSION 2b DESCRIPTION - Continued
 (c) Radar acquisition and loss summary for CSM - Continued

MSFN STATION NAME	ACQUISITION DAY HR MIN SEC			LOSS DAY HR MIN SEC			ELAPSED TIME MIN SEC			MAX ELEVATION DEG			MAX RANGE N MI			MIN RANGE N MI			REVOLUTION NUMBER		
	0	20	21	28	0	20	27	20	42	18	4	15	5	51	6·24	799·10	616·18	14·92			
USS REDSTONE	0	20	38	2	0	20	42	18	4	51	3·59	775·44	723·45	763·87	905·05	15·07	15·07				
GBM (S) USB-30*	0	20	41	11	0	20	46	3	4	51	27·52	566·27	243·72	723·45	763·87	15·09	15·09				
BDA (S) USB-30*	0	20	38	34	0	20	46	13	7	38	854·83	430·85	365·27	726·28	798·95	93·55	15·09				
ANG-91 USB-30	0	20	43	23	0	20	50	34	7	11	12·69	893·09	281·61	193·47	789·39	100·85	15·16				
USS VANGUARD	0	20	50	7	0	20	57	45	7	37	23·06	893·09	281·61	193·47	789·39	100·85	15·23				
CYI (S) USB-30*	0	20	53	8	0	20	59	23	6	15	7·82	733·95	558·44	15·24	806·81	904·57	15·24				
MAD (S) USB-85*	0	20	53	8	0	20	59	23	6	15	26·57	739·61	251·69	15·60	806·81	904·57	15·60				
CRO (S) USB-30*	0	21	25	9	0	21	33	8	7	59	19·02	800·85	329·62	329·62	800·85	904·57	15·70				
CNB (S) USB-85*	0	21	33	37	0	21	41	19	7	42	3·49	796·03	726·28	16·00	796·03	804·57	15·70				
TEX (S) USB-30*	0	22	7	22	0	22	12	8	4	46	12·92	788·12	425·59	16·06	788·12	804·57	15·70				
MIL (S) USB-30*	0	22	9	35	0	22	16	56	7	20	12·92	788·12	425·59	16·06	788·12	804·57	15·70				
GBM (S) USB-30*	0	22	9	42	0	22	17	29	7	47	24·74	807·92	265·69	16·06	807·92	904·57	15·70				
ANG-91 USB-30	0	22	13	57	0	22	19	4	5	7	4·17	871·29	697·14	16·09	871·29	904·57	15·70				
BDA (S) USB-30*	0	22	13	8	0	22	20	45	7	36	18·74	819·74	329·45	329·45	819·74	904·57	15·70				
CYI (S) USB-30*	0	22	16	35	0	22	24	24	7	50	43·41	878·34	171·12	16·16	878·34	904·57	15·70				
MAD (S) USB-85*	0	22	23	58	0	22	31	47	7	48	34·62	865·21	202·75	16·23	865·21	904·57	15·70				
GBM (S) USB-30*	0	22	27	23	0	22	31	25	4	2	2·22	911·64	786·16	16·23	911·64	904·57	15·70				
CRO (S) USB-85*	0	22	59	19	0	22	23	6	45	7	25	18·81	915·41	332·00	16·59	915·41	904·57	15·70			
CNB (S) USB-85*	0	23	15	37	0	23	23	14	45	7	30	21·86	583·94	291·30	16·61	583·94	904·57	15·70			
GTH (S) USB-30*	0	23	37	36	0	23	42	51	5	14	4·99	571·36	556·40	16·96	571·36	904·57	15·70				
WHS-15 (FPS-16M)	0	23	39	42	0	23	43	36	3	54	2·77	736·16	649·02	16·98	736·16	904·57	15·70				
TEX (S) USB-30*	0	23	39	32	0	23	46	21	6	48	24·84	563·55	206·43	16·23	563·55	904·57	15·70				
MIL (S) USB-30*	0	23	43	13	0	23	50	5	6	52	30·76	618·04	172·67	17·04	618·04	904·57	15·70				
GBM (S) USB-30*	0	23	43	39	0	23	50	26	4	47	22·87	549·91	220·22	17·04	549·91	904·57	15·70				
BDA (S) USB-30*	0	23	46	51	0	23	53	44	6	52	21·99	739·03	236·51	17·11	739·03	904·57	15·70				
USS VANGUARD	0	23	50	23	0	23	57	17	6	53	26·54	789·36	197·33	17·15	789·36	904·57	15·70				
CYI (S) USB-30*	0	23	57	39	1	0	4	39	6	59	26·93	526·66	202·62	17·22	526·66	904·57	15·70				
CRO (S) USB-30*	0	23	53	5	0	23	50	5	6	52	30·76	618·04	172·67	17·04	618·04	904·57	15·70				
(S) USB-85*	0	24	40	43	0	24	46	46	6	52	22·87	549·91	220·22	17·04	549·91	904·57	15·70				
USS HUNTSVILLE	1	0	4	32	1	0	27	5	54	8·81	700·06	434·68	17·89	700·06	904·57	15·70					
GDS (S) USB-85*	1	1	10	5	1	14	51	4	45	4·24	638·94	580·57	17·94	638·94	904·57	15·70					
GTH (S) USB-30*	1	1	9	37	1	16	37	7	0	74·48	494·50	94·62	17·97	494·50	904·57	15·70					
WHS-15 (FPS-16M)	1	1	9	37	1	17	40	6	56	10·82	904·70	475·12	17·60	904·70	904·57	15·70					
TEX (S) USB-30*	1	1	0	33	5	0	40	2	6	6·91	831·87	575·80	17·06	831·87	904·57	15·70					
MIL (S) USB-30*	1	1	0	40	43	1	0	46	6	2	6·81	700·06	434·68	17·89	700·06	904·57	15·70				
GDS (S) USB-85*	1	1	10	5	1	14	51	4	45	4·24	736·29	388·01	18·07	736·29	904·57	15·70					
BDA (S) USB-30*	1	1	9	49	1	26	51	7	1	48·91	525·07	122·05	18·09	525·07	904·57	15·70					
USS VANGUARD	1	1	33	3	1	30	10	6	36	15·42	630·83	309·06	18·13	630·83	904·57	15·70					
CYI (S) USB-30*	1	1	32	9	1	35	29	2	59	1·23	798·87	758·56	18·19	798·87	904·57	15·70					
CRO (S) USB-30*	1	1	2	6	16	2	13	46	7	29	15·87	779·57	365·78	18·60	779·57	904·57	15·70				
HAW (S) USB-30*	1	1	2	31	49	1	23	38	19	6	14·89	579·85	309·43	18·83	579·85	904·57	15·70				
GTH (S) USB-30*	1	1	17	18	1	23	33	6	14	10·62	736·29	388·01	18·07	736·29	904·57	15·70					
USS HUNTSVILLE	1	1	2	37	6	24	49	4	42	26·67	789·39	193·47	18·89	789·39	904·57	15·70					
GDS (S) USB-85*	1	1	42	3	1	24	22	6	19	17·27	779·56	272·59	18·94	779·56	904·57	15·70					
GTH (S) USB-30*	1	1	43	5	1	29	32	6	27	19·80	801·02	246·64	18·96	801·02	904·57	15·70					
WHS-15 (FPS-16M)	1	2	44	0	1	25	43	6	42	75·76	798·95	93·55	18·97	798·95	904·57	15·70					
TEX (S) USB-30*	1	2	46	3	1	22	52	34	6	30	16·97	800·85	279·98	18·99	800·85	904·57	15·70				
MIL (S) USB-30*	1	2	49	45	1	26	56	26	6	43	42·46	793·58	136·06	19·06	793·58	904·57	15·70				
GBM (S) USB-30*	1	2	50	28	1	25	57	8	6	40	26·21	785·10	200·16	19·06	785·10	904·57	15·70				
BDA (S) USB-30*	1	2	53	12	1	2	59	5	49	9·57	806·81	806·81	19·06	806·81	904·57	15·70					

TABLE IV.- ALTERNATE MISSION 2b DESCRIPTION - Continued

(c) Radar acquisition and loss summary for CSM - Continued

MSPN STATION NAME	ACQUISITION DAY HR MIN SEC	LOSS DAY HR MIN SEC	ELAPSED TIME HR MIN SEC	MAX ELEVATION DEG	MAX RANGE NM	MIN RANGE NM	REVOLUTION NUMBER
ANG-91 USB-30*	1 2 55 22	1 1 3 16 2	1 1 3 16 2	5 54	9.35	680.88	19-10
ACN (S) USB-30*	1 1 3 8 15	1 1 3 49 45	1 1 14	7 46	38-89	981.38	19-24
CRO (S) USB-30*	1 1 3 38 30	1 1 4 0 50	1 1 21	44-52	988.36	327.22	19-59
GWH (S) USB-30*	1 1 3 52 29	1 1 4 14 1	1 1 7	9-13	1026-16	789.18	19-69
HAW (S) USB-30*	1 1 4 6 7	1 1 4 19 14	1 1 7 53	16-10	933.60	432.02	19-84
USS HUNTSVILLE	1 1 4 12 36	1 1 4 19 14	1 1 6 38	9-58	713-64	500.19	19-89
GDS (S) USB-85*	1 1 4 16 34	1 1 4 23 45	1 1 7 10	26-72	598-35	217.10	19-94
GYH (S) USB-30*	1 1 4 18 22	1 1 4 25 20	1 1 6 58	22-07	534-52	241.47	19-97
WHS-15 (FP5-16M)	1 1 4 19 0	1 1 4 25 59	1 1 6 58	25-79	656-53	211.64	19-97
TEX (S) USB-30*	1 1 4 21 22	1 1 4 28 14	1 1 6 51	20-33	740-86	247.15	20-01
MIL (S) USB-10*	1 1 4 25 12	1 1 4 31 21	1 1 6 8	11-48	652-39	358.21	20-03
GBH (S) USB-30*	1 1 4 25 56	1 1 4 32 3	1 1 6 4	9-85	783-85	393.01	20-05
ANG-91 USB-30	1 1 4 30 24	1 1 4 36 58	1 1 6 33	15-32	645-55	304.71	20-09
ACN (S) USB-30*	1 1 4 44 15	1 1 4 51 5	1 1 6 50	7-77	885-51	650-48	20-22
CRO (S) USB-30*	1 1 5 15 26	1 1 5 23 11	1 1 7 44	6-44	124-19	946-75	20-55
GWH (S) USB-10*	1 1 5 26 59	1 1 5 37 1	1 1 10 2	6-08	1003-87	205-14	20-68
HAW (S) USB-30*	1 1 5 43 23	1 1 5 48 44	1 1 5 20	4-74	860-39	671-10	20-82
USS HUNTSVILLE	1 1 5 48 42	1 1 5 54 57	1 1 6 14	9-82	641-14	430-66	20-90
GDS (S) USB-85*	1 1 5 52 28	1 1 5 58 3	1 1 5 35	6-92	776-55	480-94	20-94
GYH (S) USB-30*	1 1 5 53 59	1 1 6 0 36	1 1 6 36	19-62	610-06	242-91	20-96
WHS-15 (FP5-16M)	1 1 5 55 3	1 1 6 0 15	1 1 5 11	6-03	739-28	502-14	20-98
TEX (S) USB-30*	1 1 5 57 18	1 1 6 2 2	1 1 5 27	7-20	670-45	464-20	20-98
USS MERCURY	1 1 7 0 18	1 1 7 9 5	1 1 8 47	15-10	645-77	537-76	21-63
GWH (S) USB-30*	1 1 7 4 15	1 1 7 11 5	1 1 6 49	6-92	855-47	721-19	21-64
HAW (S) USB-30*	1 1 7 19 42	1 1 7 24 36	1 1 4 54	4-43	815-93	609-21	21-83
USS HUNTSVILLE	1 1 7 24 4	1 1 7 30 52	1 1 6 48	31-96	611-08	163-51	21-89
GYH (S) USB-30*	1 1 7 31 31	1 1 7 32 45	1 1 1 3	6-63	749-69	749-69	21-91
USS MERCURY	1 1 8 35 32	1 1 8 44 24	1 1 8 51	47-03	1014-99	203-50	22-64
HAW (S) USB-30*	1 1 8 37 1	1 1 9 1 1	1 1 6 36	19-01	543-37	249-11	22-83
USS HUNTSVILLE	1 1 9 0 9	1 1 9 5 1	1 1 4 52	4-75	639-59	550-58	22-87
USS MERCURY	1 1 10 12 7	1 1 10 19 17	1 1 7 10	12-08	663-32	462-60	23-62
HAW (S) USB-30*	1 1 10 30 13	1 1 10 36 6	1 1 5 53	8-53	780-25	427-58	23-82
USS REDSTONE	1 1 10 45 33	1 1 10 52 9	1 1 6 35	7-00	1027-33	442-92	23-97
ACN (S) USB-30*	1 1 11 1 33	1 1 11 18 7	1 1 6 33	3-80	1273-08	1081-48	24-25
USS MERCURY	1 1 11 48 28	1 1 11 54 40	1 1 6 11	8-53	712-15	484-52	24-63
USS REDSTONE	1 1 12 19 21	1 1 12 28 43	1 1 7 21	45-48	1010-34	179-99	24-97
ACN (S) USB-30*	1 1 12 45 21	1 1 12 56 5	1 1 10 44	25-52	1227-53	477-79	25-25
USS MERCURY	1 1 13 23 57	1 1 13 30 37	1 1 6 40	18-37	825-04	261-65	25-63
GWH (S) USB-30*	1 1 13 30 1	1 1 13 35 52	1 1 5 50	7-97	461-73	439-14	25-66
USS REDSTONE	1 1 13 54 52	1 1 14 4 25	1 1 7 33	20-95	1143-7	464-69	25-97
ACN (S) USB-30*	1 1 14 21 0	1 1 14 31 18	1 1 10 17	23-30	1091-64	484-43	26-22
USS MERCURY	1 1 14 27 59	1 1 15 5 31	1 1 6 3	10-76	691-14	370-41	26-60
GWH (S) USB-30*	1 1 15 5 2	1 1 15 11 20	1 1 6 17	11-84	613-57	345-39	26-65
USS REDSTONE	1 1 15 41	1 1 15 40 35	1 1 9 53	18-24	1165-67	560-84	26-97
CYI (S) USB-30*	1 1 16 2 36	1 1 16 10 24	1 1 7 48	9-14	999-07	709-40	27-25
MAD (S) USB-85*	1 1 16 9 53	1 1 16 10 15	1 1 6 21	11-11	1059-99	1059-99	27-25
USS REDSTONE	1 1 17 6 7	1 1 17 17 12	1 1 10 54	33-46	1088-18	388-83	27-97
ANG-91 USB-30	1 1 17 26 46	1 1 17 33 58	1 1 7 12	6-04	1069-53	904-36	28-10
CYI (S) USB-30*	1 1 17 37 2	1 1 17 46 3	1 1 6 9	60-27	964-62	176-69	28-25

TABLE IV.- ALTERNATE MISSION 2b DESCRIPTION - Concluded
 (c) Radar acquisition and loss summary for CSM - Concluded

MSFN STATION	ACQUISITION			LOSS			ELAPSED TIME			MAX ELEVATION			MIN RANGE			REVOLUTION NUMBER
	NAME	DAY	HR	MIN	SEC	DAY	HR	MIN	SEC	MIN	SEC	DEG	N MI	N MI		
MAD (S) USB-85*	1	17	41	48		1	17	48		6	30	6.62	1011.21	654.69	28.28	
CNB (S) USB-85*	1	18	22	23		1	18	29	58	7	34	10.02	805.28	631.13	28.70	
USS REDSTONE	1	18	41	52		1	18	52	38	11	9	35.53	1168.63	378.36	28.95	
GBM (S) USB-30*	1	19	2	30		1	19	4	39	2	9	.65	1131.29	1131.29	29.04	
BDA (S) USB-30*	1	19	5	0		1	19	9	19	4	18	1.97	1049.62	1000.94	29.09	
ANG-91 USB-30	1	19	0	32		1	19	10	32	9	59	59.31	972.49	213.21	29.12	
USS VANGUARD	1	19	6	32		1	19	14	24	7	51	10.84	943.9	613.56	29.16	
CYI (S) USB-30*	1	19	13	1		1	19	21	7	8	6	20.45	835.13	328.90	29.24	
MAD (S) USB-85*	1	19	16	27		1	19	23	14	6	51	11.23	685.22	463.26	29.26	
CRO (S) USB-30*	1	19	48	39		1	19	56	51	8	12	18.69	922.38	379.66	29.60	
CNB (S) USB-85*	1	19	56	16		1	20	6	5	9	49	28.70	1149.73	368.57	29.72	
USS REDSTONE	1	20	18	6		1	20	26	17	8	11	7.45	1191.48	927.31	29.92	
TEX (S) USB-30*	1	20	32	36		1	20	37	11	4	34	2.06	1107.39	1062.66	30.00	
MIL (S) USB-30*	1	20	34	7		1	20	42	37	8	29	11.67	923.07	649.86	30.07	
GBM (S) USB-30*	1	20	34	1		1	20	43	13	9	11	17.78	867.59	486.44	30.07	
ANG-91 USB-30	1	20	36	57		1	20	45	20	8	22	13.30	1026.06	555.12	30.09	
BDA (S) USB-30*	1	20	37	48		1	20	46	26	8	40	17.63	872.4	465.67	30.11	
USS VANGUARD	1	20	41	16		1	20	49	59	8	43	44.01	1009.02	209.55	30.14	
CYI (S) USB-30*	1	20	49	12		1	20	56	32	7	20	15.24	863.23	364.17	30.24	
MAD (S) USB-85*	1	20	51	56		1	20	57	45	5	48	6.29	828.07	561.33	30.26	
CRO (S) USB-30*	1	21	23	33		1	21	32	54	9	24	36.43	996.35	272.03	30.61	
CNB (S) USB-85*	1	21	31	21		1	21	41	53	10	32	42.94	1239.76	294.13	30.72	
GYM (S) USB-30*	1	22	3	29		1	22	11	7	7	37	8.01	1176.10	775.58	30.98	
WHS-15 (FPPS-16M)	1	22	5	36		1	22	12	0	6	24	4.66	1167.88	882.69	31.00	
TEX (S) USB-30*	1	22	5	23		1	22	14	37	9	14	21.66	1129.9	430.24	31.02	
MIL (S) USB-30*	1	22	9	1		1	22	16	16	9	15	6.47	1000.33	177.62	31.07	
GBM (S) USB-30*	1	22	9	29		1	22	18	38	9	9	39.65	1089.74	245.18	31.07	
ANG-91 USB-30	1	22	15	40		1	22	18	52	3	12	1.36	1025.95	917.52	31.07	
BDA (S) USB-30*	1	22	13	6		1	22	21	41	8	35	73.35	953.86	477.70	31.09	
USS HUNTSVILLE	1	22	17	3		1	22	25	14	8	10	56.47	876.49	147.09	31.15	
CYI (S) USB-30*	1	22	24	55		1	22	32	5	7	10	20.64	730.12	262.07	31.24	
CRO (S) USB-30*	1	22	59	26		1	23	8	52	9	25	17.86	1062.29	524.69	31.61	
CNB (S) USB-85*	1	23	6	38		1	23	17	22	10	43	31.21	1008.46	403.55	31.69	
GDS (S) USB-30*	1	23	32	37		1	23	41	2	8	25	10.26	1041.4	705.65	32.05	
USS VANGUARD	1	23	38	26		1	23	45	41	7	14	7.75	947.0	734.71	31.95	
GYM (S) USB-30*	1	23	48	59		1	23	47	14	9	24	30.69	756.34	303.00	31.97	
WHS-15 (FPPS-16M)	1	23	39	28		1	23	48	18	8	49	23.54	1094.31	369.22	32.00	
TEX (S) USB-30*	1	23	40	53		1	23	49	52	8	59	52.07	953.30	192.99	32.02	
MIL (S) USB-30*	1	23	45	11		1	23	53	24	8	12	26.19	947.0	284.96	32.05	
GBM (S) USB-85*	1	23	45	57		1	23	53	38	7	40	15.97	687.6	410.76	32.66	
BDA (S) USB-30*	1	23	52	51		2	0	0	18	7	26	21.57	746.06	571.43	32.83	
USS HUNTSVILLE	2	1	7	22		2	1	16	26	9	4	77.07	1168.9	162.07	32.89	
CYI (S) USB-30*	2	1	13	15		2	0	20	30	7	15	19.55	996.29	307.48	32.94	
CRO (S) USB-30*	2	1	14	12		2	1	21	22	2	1	23.61	994.51	247.36	32.95	
CNB (S) USB-85*	2	1	15	26		2	1	21	22	6	59	79.47	932.51	97.02		

TABLE V.- ALTERNATE MISSION 2c DESCRIPTION

Event	Rev no	g.e.t., day:hr:min	Burn time, sec	ΔV, fps				IMU alignment	Resultant ellipse, h/a_p, n. mi.	TVC mode		Station contact	Comments
				Total	ΔV_x	ΔV_y	ΔV_z			primary	secondary		
Orbit insertion COI	1		39						123/126	SCS	MTVC	ETR	
First SPS burn	17	00:23:44	0.5	15	0	0	0	Preferred	120/132	GNCS	None	MIL	Minimum impulse test
Second SPS burn	19	01:02:54	42.3	940	227	882	232	Preferred	113/274	GNCS/MTVC	SCS	MIL	Place perigee in northern hemisphere and set up RCS back-up deorbit capability for touch-down in revolution 34
Third SPS burn	29	01:20:05	0.5	16.8	16.8	0	0	Deorbit	116/279	GNCS	None	CRO	Minimum impulse test
Fourth SPS burn	32	02:01:25	15.4	371	-225	0	295	Deorbit		GNCS	SCS	HAW	Deorbit burn t_F = 17 min

TABLE V.- ALTERNATE MISSION 2c DESCRIPTION - Continued
 (b) CSM lighting summary

ASSUMED LIFTOFF TIME = YEAR 1968			MONTH 8			DAY 1			HR 0			MIN 0			SEC .000		
START IN LIGHT AT T = DAY 0			HR 0			MIN 12			SEC 27.60			SUN-LIGHT, EARTH-SHIELD			MOON-LIGHT, EARTH-SHIELD		
START IN LIGHT AT T= DAY 0			HR 0			MIN 12			SEC 27.60			MOONRISE			MOONSET		
D	H	M	S	LONG	D	H	M	S	LONG	D	H	M	S	LONG	D	H	S
0	1	16	23.85	-168.20	0	2	8	37.27	25.95	0	1	37	19.15	-92.10	0	1	0
0	2	45	23.60	169.83	0	3	37	24.12	3.32	0	3	6	19.31	-113.77	0	2	29
0	4	14	12.93	147.32	0	5	6	22.60	-18.67	0	4	35	29.39	-134.65	0	3	58
0	5	43	8.78	125.18	0	6	35	9.93	-41.23	0	6	4	26.75	-156.46	0	5	27
0	7	12	.29	102.63	0	8	4	3.15	-63.46	0	7	33	37.59	-177.21	0	6	56
0	8	40	50.99	80.46	0	9	32	55.19	-85.72	0	9	2	34.16	160.98	0	7	70
0	10	9	45.65	58.32	0	11	1	43.64	-108.14	0	10	31	43.95	140.22	0	9	54
0	11	18	29.83	35.65	0	12	30	39.94	-130.15	0	12	0	41.74	118.57	0	11	23
0	13	7	26.54	13.77											0	12	52

TABLE V.- ALTERNATE MISSION 2c DESCRIPTION - Continued

(b) CSM lighting summary - Continued

SUNRISE			SUNSET			MOONRISE			MOONSET			REVOLUTION					
D	H	M	S	LONG		D	H	M	S	LONG		D	H	M	S	LONG	
0 14 36 14.77	-8.75	0 13 59 24.66	-152.73	0 13 29 48.61	97.65	0 14 21 25.43	-61.78	10.50	10.81	11.06	11.46	11.74	12.02	12.15	12.38	12.69	12.95
0 16 5 0.30	-30.86	0 15 28 19.91	-174.74	0 14 58 46.98	76.12	0 15 50 33.37	+82.68	10.81	11.06	11.46	11.74	12.02	12.15	12.38	12.69	12.95	13.08
0 17 33 57.54	-53.18	0 16 57 5.55	162.77	0 16 27 51.67	55.10	0 17 19 26.47	+104.67	11.74	12.02	12.38	12.69	13.08	13.4	13.62	13.90	14.03	14.27
0 19 2 43.81	-75.63	0 18 25 54.51	140.48	0 17 56 50.05	33.62	0 18 48 33.61	-125.59	11.74	12.02	12.38	12.69	13.08	13.4	13.62	13.90	14.03	14.27
0 20 31 37.58	-97.67	0 19 54 46.44	118.37	0 19 25 53.16	12.54	0 20 17 25.95	+147.59	11.74	12.02	12.38	12.69	13.08	13.4	13.62	13.90	14.03	14.27
0 22 0 20.72	-120.24	0 21 23 30.40	95.86	0 20 54 51.04	-8.90	0 21 46 32.57	+160.51	11.74	12.02	12.38	12.69	13.08	13.4	13.62	13.90	14.03	14.27
0 23 29 14.00	-142.25	0 22 52 24.92	73.93	0 22 23 53.16	-30.00	0 23 15 23.87	169.47	11.74	12.02	12.38	12.69	13.08	13.4	13.62	13.90	14.03	14.27
1 0 58 7.86	-164.76	1 0 21 17.25	51.79	0 23 52 46.72	-51.68	1 0 44 42.83	148.82	11.74	12.02	12.38	12.69	13.08	13.4	13.62	13.90	14.03	14.27
1 2 27 4.12	172.89	1 1 50 15.83	29.58	1 1 22 0.11	-72.63	1 2 13 43.54	126.80	11.74	12.02	12.38	12.69	13.08	13.4	13.62	13.90	14.03	14.27
1 3 56 8.26	145.43	1 3 19 38.49	10.17	1 2 51 1.06	-94.47	1 3 45 49.56	112.18	11.74	12.02	12.38	12.69	13.08	13.4	13.62	13.90	14.03	14.27
1 5 27 41.83	122.47	1 4 22 50.58	-35.45	1 5 54 28.50	-138.76	1 5 17 35.26	90.00	11.74	12.02	12.38	12.69	13.08	13.4	13.62	13.90	14.03	14.27
1 6 59 12.84	97.39	1 7 54 18.33	-58.66	1 7 26 15.70	-160.56	1 8 49 21.29	67.85	11.74	12.02	12.38	12.69	13.08	13.4	13.62	13.90	14.03	14.27
1 8 30 44.24	76.34					1 8 21 7.62	45.72	11.74	12.02	12.38	12.69	13.08	13.4	13.62	13.90	14.03	14.27

TABLE V.- ALTERNATE MISSION 2c DESCRIPTION - Continued
 (b) CSM lighting summary - Concluded

SUNRISE			MOONRISE			MOONSET			REVOLUTION			
D	H	M	S	LONG	D	H	M	S	LONG	D	H	
1	10	2	19.81	53.51	1	9	25	49.80	-81.70	1	8	58
					1	10	57	23.88	-104.57	1	10	29
					1	12	28	59.84	-127.33	1	12	31
					1	14	0	28.94	-150.44	1	13	33
					1	15	31	58.39	-173.52	1	15	4
					1	16	3	30.94	163.57	1	16	36
					1	17	35	5.75	140.80	1	17	36
					1	18	35	54.52	117.72	1	18	40
					1	19	11	33.02	-84.27	1	19	11
					1	20	42	57.87	-107.75	1	20	42
					1	21	38	15.00	94.64	1	21	41
					1	22	43	56.14	-20.50	1	22	45
					1	23	9	56.86	71.64	1	23	38
					2	0	41	39.67	48.70	2	1	10
					2	1	18	3.54	-176.82	2	1	18

TABLE V.- ALTERNATE MISSION 2c DESCRIPTION - Continued
 (c) Radar acquisition and loss summary for CSM

MSFN STATION NAME	ACQUISITION			LOSS			ELAPSED TIME			MAX ELEVATION			MIN RANGE			REVOLUTION NUMBER	
	DAY	HR	MIN SEC	DAY	HR	MIN SEC	MIN	SEC	DEG	N H	N M	N M					
BDA (S) USB-30*	0	12	26	0	13	39	1	12	4.82	684.80	673.35	2.11					
USS VANGUARD	0	12	26	0	17	16	4	50	29.62	764.14	231.70	2.15					
CYI (S) USB-30*	0	16	45	0	0	24	7	42	35.03	541.23	201.26	2.22					
CRO (S) USB-30*	0	0	52	36	0	0	59	46	12.66	698.77	443.55	2.59					
CNB (S) USB-85*	0	1	0	16	0	1	6	42	6.26	7.14	889.16	592.85	4.68				
USS HUNTSVILLE	0	1	24	2	0	1	30	41	6.39	8.72	882.81	530.21	2.91				
GDS (S) USB-85*	0	1	29	30	0	1	35	21	5.50	6.29	781.19	611.08	2.94				
GYN (S) USB-30*	0	1	29	3	0	1	34	59	7.56	38.77	822.92	186.57	2.98				
WHS-15 (FPPS-16H)	0	1	30	35	0	1	38	7	7.32	22.79	584.49	283.19	2.98				
TEX (S) USB-30*	0	1	32	5	0	1	39	57	7.52	31.51	835.60	220.21	3.01				
MIL (S) USB-30*	0	1	35	58	0	1	43	46	7.48	23.62	812.70	277.07	3.06				
GBM (S) USB-30*	0	1	36	41	0	1	44	8	7.27	18.35	593.78	335.89	3.06				
ANG-91 (S) USB-30*	0	1	43	14	0	1	46	12	2.57	1.47	830.54	830.54	3.08				
BDA (S) USB-30*	0	1	39	24	0	1	47	22	7.58	26.93	741.76	253.86	3.10				
USS VANGUARD	0	1	43	9	0	1	50	39	7.30	19.58	885.28	318.93	3.15				
CYI (S) USB-30*	0	1	51	42	0	1	56	32	4.50	3.65	902.76	717.06	3.09				
CRO (S) USB-30*	0	2	26	32	0	2	34	10	7.37	21.44	591.64	305.60	3.59				
HAW (S) USB-30*	0	2	51	57	0	2	59	12	7.15	12.58	806.06	430.47	3.84				
USS HUNTSVILLE	0	2	57	0	0	3	4	54	7.55	42.42	834.04	173.86	3.91				
GDS (S) USB-85*	0	3	2	6	0	0	3	9	3.36	7.29	17.16	839.08	350.99	3.94			
GYN (S) USB-30*	0	3	3	0	0	0	3	10	4.45	7.44	26.57	870.95	252.15	3.98			
WHS-15 (FPPS-16H)	0	3	4	3	0	0	3	11	5.59	41.57	826.27	176.10	3.98				
TEX (S) USB-30*	0	3	6	12	0	0	3	13	51	7.38	21.23	861.06	300.47	4.01			
MIL (S) USB-30*	0	3	9	51	0	0	3	17	47	7.56	30.50	767.30	225.13	4.05			
GBM (S) USB-30*	0	3	10	34	0	0	3	18	19	7.42	31.04	525.04	217.49	4.05			
BDA (S) USB-30*	0	3	13	20	0	0	3	20	34	7.13	14.69	900.42	390.97	4.10			
ANG-91 (S) USB-30*	0	3	15	38	0	0	3	22	23	6.45	9.91	760.66	495.34	4.10			
USS VANGUARD	0	3	17	59	0	0	3	22	40	4.41	3.46	884.79	726.61	4.12			
ACN (S) USB-30*	0	3	22	0	0	3	34	34	7.12	14.45	902.17	392.46	4.24				
CRO (S) USB-30*	0	4	0	15	0	0	4	8	7.53	37.89	878.52	193.06	4.58				
HAW (S) USB-30*	0	4	25	23	0	0	4	33	8	7.45	21.51	791.26	294.98	4.84			
USS HUNTSVILLE	0	4	31	18	0	0	4	38	33	7.15	14.44	905.89	396.68	4.91			
GDS (S) USB-85*	0	4	35	31	0	0	4	43	13	7.41	18.73	774.92	328.82	4.96			
GYN (S) USB-30*	0	4	37	0	0	0	4	44	45	7.44	27.28	867.53	246.33	4.98			
WHS-15 (FPPS-16H)	0	4	37	47	0	0	4	45	41	7.54	27.64	772.09	242.15	4.98			
TEX (S) USB-30*	0	4	40	1	0	0	4	47	56	7.55	37.72	821.84	189.71	5.01			
HAW (S) USB-30*	0	4	43	43	0	0	4	51	18	7.34	15.82	763.94	369.87	5.05			
GBM (S) USB-30*	0	4	44	28	0	0	4	52	4	7.36	26.45	904.68	250.55	5.05			
BDA (S) USB-30*	0	4	49	20	0	0	4	51	19	1.58	0.93	855.23	855.23	5.05			
ANG-91 (S) USB-30*	0	4	48	58	0	0	4	54	45	7.47	36.78	860.45	191.92	5.10			

TABLE V.- ALTERNATE MISSION 2c DESCRIPTION - Continued
(c) Radar acquisition and loss summary for CSM - Continued

HSFN STATION	ACQUISITION	LOSS	ELAPSED TIME	MAX ELEVATION	MIN RANGE	REVOLUTION NUMBER
NAME	DAY HR MIN SEC	DAY HR MIN SEC	MIN SEC	DEG	N MI	N MI
ACN (S) USB-30*	0 5 36	0 5 10 18	7 1 1	14°15	650.00	400.67
CRO (S) USB-30	0 5 35	0 5 39 53	4 29	2°77	787.82	765.17
GWH (S) USB-30	0 5 45	0 5 53 37	7 44	21°76	790.46	5.68
HAW (S) USB-30*	0 6 0 11	0 6 6 34	6 22	7°19	902.25	5.84
USS HUNTSVILLE	0 6 5 32	0 6 12 42	7 9	12°62	878.40	412.14
GDS (S) USB-85*	0 6 9 22	0 6 16 19	6 56	11°91	707.27	445.22
GYH (S) USB-30	0 6 10 48	0 6 18 36	7 47	46°89	890.84	160.56
WHS*15 (FPPS-16H)	0 6 11 48	0 6 18 41	6 53	10°67	873.45	473.43
MIL (S) USB-30*	0 6 19 36	0 6 22 20	2 43	1°20	839.20	5.99
TEX (S) USB-30*	0 6 14 0	0 6 21 15	7 15	12°91	818.69	422.47
GBM (S) USB-30*	0 6 19 58	0 6 23 15	3 16	1°30	851.64	832.53
ANG-91 (S) USB-30	0 6 25	0 6 27 34	2 15	1°12	842.34	6.05
USS MERCURY	0 7 16 19	0 7 23 7	4 48	3°65	882.36	717.72
GWH (S) USB-30*	0 7 20 9	0 7 26 54	6 45	8°69	848.73	6.67
HAW (S) USB-30*	0 7 34 41	0 7 40 48	6 6	6°41	862.93	4.84
GDS (S) USB-85*	0 7 45 2	0 7 47 12	2 10	28°91	853.74	6.90
USS HUNTSVILLE	0 7 39 13	0 7 47 5	7 52	79°81	797.15	234.32
GYH (S) USB-30*	0 7 45 21	0 7 51 8	5 47	6°13	805.53	6.94
USS MERCURY	0 8 50 20	0 8 58 8	7 47	40°43	879.38	179.37
HAW (S) USB-30*	0 8 15 6	0 8 15 9	15 39	7 24	14°52	864.15
USS HUNTSVILLE	0 8 13 14	0 8 20 21	9 20	14°06	671.37	398.58
USS MERCURY	0 8 10 24	0 8 31 49	7 30	18°87	875.81	326.69
HAW (S) USB-30*	0 8 10 41	0 8 52 0	10 49	3°33	21°26	784.87
USS MERCURY	0 8 11 58	0 8 12 5	41 7	4°12	21°31	293.52
HAW (S) USB-30*	0 8 12 16	0 8 12 19	19 33	1 20	697.64	436.95
USS REDSTONE	0 8 12 30	0 8 12 36	25 3	22°47	579.13	9.77
ACN (S) USB-30*	0 8 12 57	0 8 13 24	6 1	6°72	771.18	10.24
USS MERCURY	0 8 13 32	0 8 13 40	2 7	22°45	599.85	284.10
GWH (S) USB-30*	0 8 13 38	0 8 13 44	58 6	10°02	829.16	8.82
USS REDSTONE	0 8 14 4	0 8 14 12	14 12	1°39	879.45	9.63
ACN (S) USB-30*	0 8 14 30	0 8 14 38	5 3	37°45	287.94	9.74
USS MERCURY	0 8 15 6	0 8 15 13	52 7	27°57	596.70	10.62
GWH (S) USB-30*	0 8 15 11	0 8 15 19	37 7	26°92	759.53	243.19
USS REDSTONE	0 8 15 38	0 8 15 46	1 1	13°35	643.97	423.71
USS MERCURY	0 8 16 41	0 8 16 45	9 3	29°44	551.30	234.57
GWH (S) USB-30*	0 8 16 47	0 8 16 50	37 2	37°45	873.32	10.94
USS REDSTONE	0 8 17 12	0 8 17 15	15 12	2°57	843.48	10.95
CYI (S) USB-30*	0 8 17 42	0 8 17 49	28 7	17°95	586.6	345.19
MAD (S) USB-85*	0 8 17 48	0 8 17 50	42 2	2°46	874.33	413.53
CNB (S) USB-85*	0 8 18 30	0 8 18 30	47 0	0 41	887.19	879.05
USS VANGUARD	0 8 18 46	0 8 18 54	20 5	7 50	70.96	893.25
ANG-91 (S) USB-30	0 8 19 4	0 8 19 11	40 6	10°63	701.72	471.92
USS VANGUARD	0 8 19 12	0 8 19 13	26 1	6 6	890.81	890.81
CYI (S) USB-30*	0 8 19 15	0 8 19 23	24 7	5 55	729.60	257.37
MAD (S) USB-85*	0 8 19 19	0 8 19 25	29 5	5 57	754.61	589.17
CRO (S) USB-30	0 8 19 52	0 8 19 57	46 5	4°50	897.02	676.61
CNB (S) USB-85*	0 8 20 0	0 8 20 6	52 6	9°14	853.91	519.05
USS REDSTONE	0 8 20 20	0 8 20 46	52 5	4°46	865.56	628.24
GWH (S) USB-30*	0 8 20 37	0 8 20 41	32 3	1°97	807.21	796.01

TABLE V.- ALTERNATE MISSION 2c DESCRIPTION - Continued
(c) Radar acquisition and loss summary for CSM - Continued

MSFN STATION NAME	ACQUISITION			LOSS			ELAPSED TIME			MAX ELEVATION			MIN RANGE			REVOLUTION NUMBER		
	DAY	HR	MIN	SEC	DAY	HR	MIN	SEC	MIN	SEC	DEG	N MI	N MI	N MI	N MI	N MI	N MI	
BDA (S) USB-30 [*]	0	20	40	40	0	20	45	25	4	44	721.07	15.10						
ANG-9 USB-30 [*]	0	20	38	3	0	20	44	7	7	7	720.94	15.15						
USS VANGUARD	0	20	42	53	0	20	50	0	14	29	625.67	15.15						
CYI (S) USB-30 [*]	0	20	49	29	0	20	57	7	7	37	790.96	15.24						
MAD (S) USB-85 [*]	0	20	52	38	0	20	58	46	6	7	6.74	15.27						
CRO (S) USB-30 [*]	0	21	39	-	0	21	32	27	7	47	58.78	15.57						
CNB (S) USB-85 [*]	0	21	33	1	0	21	40	37	7	36	49.05	15.71						
TEX (S) USB-30 [*]	0	22	6	50	0	22	11	25	4	35	22.60	15.71						
MIL (S) USB-30 [*]	0	22	8	59	0	22	16	15	7	15	876.68	16.01						
GFM (S) USB-30 [*]	0	22	9	4	0	22	16	45	7	40	22.60	16.05						
ANG-91 USB-30 [*]	0	22	13	24	0	22	18	24	5	1	763.19	16.07						
BDA (S) USB-30 [*]	0	22	12	38	0	22	20	7	7	29	22.12	16.10						
USS VANGUARD	0	22	16	2	0	22	23	53	7	50	33.78	16.15						
CYI (S) USB-30 [*]	0	22	22	18	0	22	31	6	7	48	613.91	16.24						
MAD (S) USB-85 [*]	0	22	26	47	0	22	30	50	4	3	2.55	16.27						
CRO (S) USB-30 [*]	0	22	58	39	0	22	34	6	7	28	18.69	16.34						
CNB (S) USB-85 [*]	0	23	6	37	0	23	14	5	7	70	60.80	16.48						
GFM (S) USB-30 [*]	0	23	36	29	0	23	42	59	6	29	9.73	16.54						
WHS-15 (FPSS-16H)	0	23	38	21	0	23	43	55	5	34	5.63	16.65						
TEX (S) USB-30 [*]	0	23	38	43	0	23	46	21	7	38	34.40	16.74						
MIL (S) USB-30 [*]	0	23	42	22	0	23	50	10	7	47	44.28	16.75						
GFM (S) USB-30 [*]	0	23	42	54	0	23	50	28	7	34	29.14	16.83						
ANG-91 USB-30 [*]	0	23	50	28	0	23	50	45	0	17	0.12	16.96						
BDA (S) USB-30 [*]	0	23	45	58	0	23	53	53	7	54	776.18	16.97						
CYI (S) USB-30 [*]	0	23	49	36	0	23	57	31	7	54	857.98	17.05						
CRO (S) USB-30 [*]	0	23	57	3	0	24	0	4	3	34	763.64	17.15						
WHS-15 (FPSS-16H)	0	24	0	32	0	24	0	40	7	22	13.72	17.21						
CNB (S) USB-85 [*]	1	0	40	39	0	40	0	46	6	11	6.24	17.32						
USS HUNTSVILLE	1	1	4	9	1	1	11	12	7	2	10.98	17.40						
GDS (S) USB-85 [*]	1	1	9	36	1	1	15	48	4	11	7.75	17.45						
GFM (S) USB-30 [*]	1	1	9	24	1	1	17	19	7	54	25.18	17.54						
ANG-71 USB-30 [*]	1	1	10	10	1	1	18	25	7	34	32.54	17.63						
TEX (S) USB-30 [*]	1	1	12	34	1	1	20	14	7	40	27.73	17.78						
MIL (S) USB-30 [*]	1	1	16	24	1	1	24	5	7	40	30.82	17.86						
GFM (S) USB-30 [*]	1	1	2	4	1	1	24	28	7	53	15.47	17.99						
ANG-91 USB-30 [*]	1	1	2	33	1	1	30	52	7	19	0.98	18.01						
USS VANGUARD	1	1	23	33	1	1	34	4	3	33	1.92	18.05						
CYI (S) USB-30 [*]	1	1	32	31	1	1	36	4	2	14	2.56	18.16						
CRO (S) USB-30 [*]	1	1	2	4	1	1	38	38	7	50	60.135	18.57						
HAW (S) USB-30 [*]	1	1	2	32	1	2	39	43	7	30	18.39	18.84						
USS HUNTSVILLE	1	1	2	37	1	2	45	14	7	46	27.07	18.91						
GDS (S) USB-85 [*]	1	1	2	42	1	2	49	51	7	27	20.05	19.04						
CYI (S) USB-30 [*]	1	1	2	43	1	2	51	5	7	29	870.29	19.05						
CRO (S) USB-30 [*]	1	1	2	44	1	2	52	13	7	40	25.41	19.05						
HAW (S) USB-30 [*]	1	1	2	46	1	2	54	9	7	27	71.28	19.08						
USS HUNTSVILLE	1	1	2	47	1	2	55	3	7	27	24.09	19.10						
ANG-71 USB-30 [*]	1	1	2	50	1	2	58	3	7	41	62.74	19.15						
GDS (S) USB-30 [*]	1	1	2	51	1	2	58	36	7	33	38.51	19.16						
CYI (S) USB-30 [*]	1	1	2	51	1	2	58	36	7	33	902.47	19.16						
CRO (S) USB-30 [*]	1	1	2	51	1	2	58	36	7	33	909.05	19.16						
HAW (S) USB-30 [*]	1	1	2	53	1	2	53	55	7	33	12.33	19.08						

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TABLE V.- ALTERNATE MISSION 2c DESCRIPTION - Continued
 (c) Radar acquisition and loss summary for CSM - Continued

MSFN STATION	ACQUISITION	LOSS	ELAPSED TIME	MAX ELEVATION	MIN RANGE	REVOLUTION NUMBER
NAME	DAY HR MIN SEC	DAY HR MIN SEC	MIN SEC	DEG	N MI	N MI
ANG-91 USB-30*	1 2 55 58	1 2 38	6 40	10°42'	734.68	19°10'
USS VANGUARD	1 2 58 42	1 3 32	3 49	2°33'	863.63	19°10'
ACN (S) USB-30*	1 3 9 25	1 3 31	6 6	17°70'	947.34	19°24'
CRO (S) USB-30*	1 3 39 44	1 3 52	2 12	17°48'	1155.91	19°60'
GWH (S) USB-30*	1 3 54 28	1 4 21	7 53	37°99'	1290.05	976.24
HAW (S) USB-30*	1 4 7 20	1 4 16	9 29	18°66'	864.50	19°83'
USS HUNTSVILLE	1 4 13 45	1 4 22	9 23	18°46'	861.14	19°90'
GDS (S) USB-85*	1 4 18 31	1 4 26	7 50	22°29'	934.07	19°95'
GYH (S) USB-30*	1 4 19 58	1 4 28	6 3	26°57'	797.43	19°97'
WHS-15 (RPS-16M)	1 4 20 55	1 4 28	7 46	36°93'	530.15	19°97'
TEX (S) USB-30*	1 4 23 8	1 30 52	7 43	56°78'	557.06	138°57'
MIL (S) USB-30*	1 4 27 5	1 34 15	7 10	17°10'	617.12	332°12'
GBM (S) USB-30*	1 4 27 40	1 34 57	7 16	19°20'	875.82	304°47'
ANG-91 USB-30	1 4 32 16	1 39 56	7 40	21°65'	763.65	287°64'
ACN (S) USB-30*	1 4 45 42	1 4 54	6 54	17°14'	820.08	468°63'
CRO (S) USB-30*	1 5 17 31	1 5 27	9 52	11°78'	1256.38	20°00'
GWH (S) USB-30*	1 5 29 39	1 5 40	10 51	43°78'	1068.38	20°44'
HAW (S) USB-30*	1 5 45 22	1 5 53	1 7	11°68'	936.18	20°44'
USS HUNTSVILLE	1 5 51 15	1 5 58	47	7 32	663.50	370°41'
GDS (S) USB-85*	1 5 55 30	1 6 2	4 33	9°66'	686.65	490.48
GYH (S) USB-30*	1 5 56 57	1 6 4	31 7	35°44'	535.86	189.18
WHS-15 (RPS-16M)	1 5 58 1	1 6 4	23 6	22°89'	753.05	501°99'
GBM (S) USB-30*	1 6 4 46	1 6 7	43 0	0°17	880.38	680.38
TEX (S) USB-30*	1 6 0 13	1 6 6	53 0	10°50'	887.32	456°50'
ANG-91 USB-30	1 6 11 43	1 6 13	31 1	1°48'	901.31	901.31
ACN (S) USB-30*	1 6 24 40	1 6 30	2 5	2°94'	1118.79	1016.42
USS MERCURY	1 7 4 36	1 7 13	19 8	42 11°20'	1229.14	718.56
GWH (S) USB-30*	1 7 7 19	1 7 16	34 9	15 16°28'	943.68	536.90
HAW (S) USB-30*	1 7 23 8	1 7 29	53 6	9°26'	734.65	529.84
USS HUNTSVILLE	1 7 28 4	1 7 35	51 7	46 26°69'	758.94	23°48'
GYH (S) USB-30*	1 7 34 39	1 7 39	27 4	47 25°89'	851.31	684.65
USS MERCURY	1 8 40 34	1 8 50	9 50	36°16'	1154.69	300.39
GWH (S) USB-30*	1 8 47 19	1 8 51	23 3	1°91'	985.32	946.95
HAW (S) USB-30*	1 8 59 47	1 9 7	15 7	28 19°16'	807.88	310.10
USS HUNTSVILLE	1 9 5 15	1 9 11	42 6	26°69'	752.55	491.71
GYH (S) USB-30*	1 10 17 56	1 10 26	42 8	45 25°89'	931.70	323°18'
HAW (S) USB-30*	1 10 36 40	1 10 43	7 7	14°77'	842.93	348.42
USS REDSTONE	1 10 53 32	1 10 58	55 6	3°91'	1127.22	849.99
USS MERCURY	1 13 32 33	1 13 40	17 7	44 32°73'	878.17	206°05'
GWH (S) USB-30*	1 13 38 45	1 13 45	29 6	44 10°34'	863.70	459.68
USS REDSTONE	1 14 3 46	1 14 37	1 37 0	50 1°13'	892.66	24°66'
ACN (S) USB-30*	1 14 30 24	1 14 42	0 1	36 32°41'	1148.60	342°37'
USS MERCURY	1 15 9 25	1 15 16	31 7	5 16°06'	1297.62	536°24'
GWH (S) USB-30*	1 15 15 2	1 15 22	30 7	27 20°79'	608.74	345°61'

TABLE V.- ALTERNATE MISSION 2c DESCRIPTION - Continued

(c) Radar acquisition and loss summary for CSM - Continued

MSFN STATION NAME	ACQUISITION			LOSS			ELAPSED TIME			MAX ELEVATION			MIN RANGE			REVOLUTION NUMBER		
	DAY	HR	MIN	SEC	DAY	HR	MIN	SEC	MIN	SEC	DEG	N	H	I	N	M	I	
USS REDSTONE ACN (S) USB~30*	1	15	40	49	1	15	52	2	11	13	27.60	1242.24	481.88	26.97	1113.74	27.19		
CYI (S) USB~30*	1	16	10	7	1	16	15	52	5	45	3.18	1234.49	1113.74	27.19	0.00.67	27.25		
USS REDSTONE ANG~91 USB~30	1	16	13	55	1	16	21	35	7	39	6.47	1130.21	361.07	27.97	1249.24	361.07		
CYI (S) USB~30*	1	17	17	33	1	17	29	36	12	3	44.41	1124.76	1034.06	28.11	5.21	1124.76		
BDA (S) USB~30*	1	17	38	59	1	17	46	13	7	13	31.81	1054.54	326.44	28.24	31.81	1054.54		
ANG~91 USB~30	1	17	49	16	1	17	58	57	9	41	34.67	1102.29	367.63	29.11	1085.17	827.90		
MAD (S) USB~85*	1	17	54	32	1	18	0	51	6	19	4.82	1125.66	758.09	28.26	7.42	1125.66		
CNB (S) USB~85*	1	18	35	33	1	18	43	1	7	28	7.41	1211.28	803.24	28.72	1276.15	362.03		
USS REDSTONE CRO (S) USB~30*	1	18	54	24	1	19	6	32	12	8	46.18	1161.16	1161.16	29.09	1161.16	1161.16		
BDA (S) USB~30*	1	19	19	11	1	19	22	16	3	5	1.08	1102.29	367.63	29.11	1102.29	367.63		
ANG~91 USB~30	1	19	13	48	1	19	24	33	10	45	34.67	1125.66	758.09	29.15	1085.17	827.90		
USS VANGUARD	1	19	20	14	1	19	28	8	7	54	8.55	1011.15	204.38	29.25	1226.99	204.38		
CYI (S) USB~30*	1	19	26	14	1	19	35	25	9	11	50.48	956.86	631.69	29.27	7.37	1276.15		
MAD (S) USB~85*	1	19	30	14	1	19	37	17	7	3	7.82	1155.26	521.08	29.62	1155.26	521.08		
CRO (S) USB~30*	1	20	2	40	1	20	11	11	8	31	15.42	1044.20	461.58	29.71	1044.20	461.58		
CNB (S) USB~85*	1	20	10	23	1	20	20	44	10	21	24.87	1266.78	903.34	29.93	1266.78	903.34		
USS REDSTONE	1	20	32	9	1	20	41	52	9	43	10.61	1160.55	602.24	30.12	1160.55	602.24		
TEX (S) USB~30*	1	20	47	41	1	20	51	36	3	55	1.38	1220.51	1220.51	30.01	1220.51	1220.51		
MIL (S) USB~30*	1	20	48	53	1	20	57	33	8	39	10.16	1276.02	779.21	30.07	1276.02	779.21		
GBM (S) USB~30*	1	20	49	42	1	20	58	17	9	35	15.13	1242.60	638.30	30.07	1242.60	638.30		
ANG~91 USB~30	1	20	51	8	1	21	1	2	9	54	23.54	884.74	439.30	30.10	1266.78	903.34		
BDA (S) USB~30*	1	20	52	32	1	21	1	33	9	1	4.50	1194.72	423.04	30.12	1194.72	423.04		
USS VANGUARD	1	20	55	54	1	21	5	18	9	24	28.66	996.00	341.87	30.17	1226.99	204.38		
CTJ (S) USB~30*	1	21	3	35	1	21	12	12	8	36	23.92	767.15	317.96	30.24	1276.02	779.21		
MAD (S) USB~85*	1	21	6	56	1	21	13	8	6	12	5.73	996.70	672.37	30.26	1242.60	638.30		
CRO (S) USB~30*	1	21	38	30	1	21	48	54	10	24	66.27	996.17	214.83	30.60	1209.80	334.64		
CNB (S) USB~85*	1	21	46	37	1	21	57	59	11	22	31.64	1194.72	423.04	30.72	1194.72	423.04		
GYM (S) USB~30*	1	22	19	29	1	22	27	12	7	42	6.64	1188.73	934.30	30.99	1188.73	934.30		
WHS-15 (FPPS=16H)	1	22	21	49	1	22	27	55	6	5	3.93	1137.38	126.90	30.99	1137.38	126.90		
TEX (S) USB~30*	1	22	21	16	1	22	30	59	9	38	1.84	957.42	572.53	31.01	1100.63	241.75		
MIL (S) USB~30*	1	22	24	51	1	22	34	49	9	57	31.44	1041.74	219.17	31.04	1041.74	219.17		
GBM (S) USB~30*	1	22	25	11	1	22	35	13	10	2	57.02	1085.40	430.25	31.06	1085.40	430.25		
ANG~91 USB~30	1	22	30	9	1	22	36	59	6	49	6.00	1021.71	807.95	31.08	1137.38	126.90		
BDA (S) USB~30*	1	22	29	1	22	36	59	9	23	28.31	1176.49	342.69	31.11	1176.49	342.69			
USS VANGUARD	1	22	32	59	1	22	41	54	8	55	38.33	1100.63	241.75	31.14	1100.63	241.75		
CYI (S) USB~30*	1	22	40	54	1	22	48	54	8	0	84.94	955.00	124.32	31.22	1240.87	400.27		
CRO (S) USB~30*	1	23	15	29	1	23	26	23	10	54	29.59	1085.40	519.61	31.61	1085.40	519.61		
WHS-15 (FPPS=16H)	1	23	24	56	1	23	34	44	11	28	27.79	1070.16	506.20	31.08	1120.95	639.81		
TEX (S) USB~30*	1	23	57	50	1	23	58	6	8	43	8.99	1136.14	886.84	31.97	1136.14	886.84		
USS HUNTSVILLE	1	23	49	43	1	23	4	4	7	15	6.28	1240.87	519.61	32.00	1240.87	519.61		
GDS (S) USB~30*	1	23	55	49	2	0	3	4	10	0	26.32	1164.79	519.61	32.00	1164.79	519.61		
GYM (S) USB~30*	1	23	54	53	2	0	4	54	10	0	1.02	1085.40	430.25	32.02	1085.40	430.25		
WHS-15 (FPPS=16H)	1	23	56	58	2	0	5	58	9	20	2.05	1120.95	506.20	31.91	1120.95	506.20		
TEX (S) USB~30*	1	23	57	50	2	0	7	52	10	1	4.46	976.13	191.10	32.02	957.49	196.41		
MIL (S) USB~30*	2	0	2	4	2	0	11	24	9	19	55.38	1092.23	317.03	32.07	1092.23	317.03		
GBM (S) USB~30*	2	0	2	4	2	0	11	50	9	4	28.81	915.11	176.73	32.10	915.11	176.73		
BOA (S) USB~30*	2	0	4	4	2	0	14	52	8	47	54.07	889.34	670.19	32.10	889.34	670.19		
ANG~91 USB~30	2	0	9	9	2	0	13	33	4	23	2.45	25.61	825.31	278.45	32.14	825.31	278.45	
USS VANGUARD	2	0	10	4	2	0	18	18	4	13	2.05	776.82	501.38	32.14	776.82	501.38		
CYI (S) USB~30*	2	0	18	15	2	0	24	46	32	9	2.26							

TABLE V.- ALTERNATE MISSION 2c DESCRIPTION - Concluded
 (c) Radar acquisition and loss summary for CSM - Concluded

MSFN STATION	ACQUISITION			LOSS			ELAPSED TIME			MAX ELEVATION			MAX RANGE			MIN RANGE			REVOLUTION		
	NAME	DAY	HR	MIN	SEC	DAY	HR	MIN	SEC	MIN	SEC	DEG	N	MI	N	MI	N	MI	N	MI	
CRO (S) USB=30°	2	0	52	34		2	1	4	10	11	36	29°65'	1191°39'	475°09'	32°62'						
CNB (S) USB=85°	2	1	0	34		2	1	10	26	9	52	11°27'	1295°57'	876°32'	32°47'						
HAW (S) USB=30°	2	1	20	21		2	1	29	48	9	26	14°15'	1330°49'	694°19'	32°84'						
USS HUNTSVILLE	2	1	25	34		2	1	35	20	9	45	45°16'	1279°15'	251°74'	32°90'						
GDS (S) USB=85°	2	1	31	47		2	1	39	11	7	23	13°55'	1084°79'	448°20'	32°94'						
GYM (S) USB=30°	2	1	32	24		2	1	40	21	7	56	55°31'	1091°43'	146°50'	32°96'						
WHS-15 (FPS=16Hz)	2	1	33	51		2	1	41	16	7	24	36°38'	1026°57'	178°16'	32°97'						

TABLE VI.- ALTERNATE MISSION 3a DESCRIPTION

(a) Maneuver plan												
Event	Rev no	E.g.t., day:hr:min	Burn time, sec	ΔV , fps			IMU alignment	Resultant ellipse, h/a_p, n. mi.	TVC mode		Station contact	Comments
				Total	ΔV_x	ΔV_y			primary	secondary		
Orbit insertion	1						Launch	123/153			EIR	Nominal insertion
S-IVB/CSM separation (RCS)	2	00:02:55	2.6	1	1	0	0	127/172	SCS	HAW		
SM RCS phasing maneuver	3	00:03:20	19.2	7.5	-7.5	0	0	126/168	SCS	ANG	Set up proper phase offset for rendezvous	
First SPS burn	17	01:02:25	10.1	209	55	1	202	TPI	121/198	GNCS	CRO	NCC
Second SPS burn	18	01:04:00	8.8	186	-88	0	-164	TPI	117/157	GNCS	CRO	NSR
Third SPS burn	28	01:19:58	12.2	262	14	129	-228	Preferred	98/198	GNCS	CRO	Place perigee in northern hemisphere. Lower perigee to be consistent with RCS deorbit capability
Fourth SPS burn	32	02:01:30	56.5	1283	39	1270	179	Preferred	88/245	GNCS/MTVC	MIL	Set up RCS deorbit capability for touchdown in revolution 47
Fifth SPS burn	42	02:17:55	.5	11.7	11.7	0	0	Deorbit	90/250	GNCS	--	Minimum impulse test
Sixth SPS burn	45	02:23:44	11.1	279	-173	0	219	Deorbit	--	GNCS	HAW	Deorbit maneuver t _{ff} = 17 min

TABLE VI.- ALTERNATE MISSION 3a DESCRIPTION - Continued
 (b) CSM lighting summary

(ASSUMED LIFTOFF TIME = YEAR 1968 MONTH 8 DAY 1 HR 0 MIN 0 SEC .00)				SUN-LIGHT, EARTH-SHIELD				MOON-LIGHT, EARTH-SHIELD						
START IN U H M S			LONG	START IN U H M S			LONG	MOONRISE			D H M S	LONG	REVOLUTION	
UMBRA AT T = DAY 0			HR 2 MIN 54 SEC 55.00	UMBRA AT T = DAY 0			HR 2 MIN 54 SEC 55.00	MOONSET			D H M S	LONG		
U	H	M	S	U	H	M	S	U	H	M	S	LONG		
0	4	16	7.54	145.63	0	5	39	33.34	4.77	0	3	7	43.77 -114.01	
0	5	45	53.65	123.43	0	6	39	1.02	-40.22	0	4	37	39.24 -135.52	
0	7	15	38.95	101.00	0	8	46.00	-62.64	0	7	37	30.74 -178.47	2.92	
0	8	45	23.28	78.52	0	9	38	31.57	-85.02	0	9	7	26.14 160.06	3.24
0	10	15	6.59	55.99	0	11	8	16.25	-107.44	0	10	37	21.29 138.57	3.49
0	11	44	48.00	33.38	0	12	37	55.70	-130.13	0	12	7	16.18 117.08	5.63
0	13	14	27.66	10.68	0	14	7	36.73	-152.73	0	13	37	10.78 95.57	5.86
0	14	44	10.97	-11.83	0	15	7	5.08	74.06	0	14	30	8.18 -61.14	4.18
0	15	37	19.03	-175.25	0	16	0	.83	-82.90	0	16	0	.00	4.43

TABLE VI.- ALTERNATE MISSION 3a DESCRIPTION - Continued

(b) CSM lighting summary - Continued

-----SUNRISE-----			-----MOONSET-----			-----MOONRISE-----			-----MOONSET-----			REVOLUTION		
D	H	M	S	LONG	D	H	M	S	LONG	D	H	M	S	LONG
0 16 13 56.50	-34.21				0 17 7 2.34	162.29	0 16 36 59.05	52.53		0 17 29 53.56	-104.65	11.13	11.39	
0 17 43 41.17	-56.63				0 18 36 46.46	139.68	0 18 6 52.66	30.99		0 18 59 46.36	-126.40	11.69	11.94	
0 19 13 24.79	-79.09				0 20 6 31.26	117.51	0 19 36 45.87	9.42		0 20 29 39.24	-148.13	12.07	12.33	
0 20 43 7.11	-101.62				0 21 36 14.66	95.08	0 21 6 38.66	-12.16		0 21 59 32.19	-169.87	12.63	12.88	
0 22 12 47.76	-124.23				0 23 5 53.19	72.40	0 22 36 30.98	-33.77		0 23 29 25.21	168.41	13.01	13.27	
0 23 42 26.30	-146.95				1 0 35 33.46	49.82	1 0 6 22.76	-55.42		1 0 59 18.29	146.69	13.57	13.57	
1 1 12 9.36	-169.42				1 1 36 16.48	-76.91						13.82		
1 2 5 26.97	27.98				1 2 5 15.08	27.31						13.95		
1 2 42 3.21	169.20				1 2 5 19.16	27.53						14.21		
1 4 12 10.76	145.70				1 3 35 53.85	6.59	1 3 5 43.05	-99.44		1 2 29 9.95	124.99	14.49	14.76	
1 5 41 28.12	123.05				1 5 4 35.76	-17.90	1 4 36 40.15	-119.31		1 3 59 39.43	103.17	15.15	15.43	
1 7 11 8.20	100.77				1 6 34 27.48	-40.25	1 6 6 16.23	-140.87		1 5 29 9.79	81.42	15.70	15.70	
1 8 40 44.00	78.23				1 6 4 7.66	-62.52	1 7 35 58.07	-162.82		1 6 58 54.87	59.65	16.09	16.37	
1 10 10 16.58	55.52				1 9 33 39.72	-85.22	1 9 5 48.14	175.82		1 8 28 43.30	37.97	16.45	16.45	
					1 10 35 37.74	154.43				1 9 58 32.08	16.31	16.72	16.99	
												22.28	22.39	
												22.66		

TABLE VI.- ALTERNATE MISSION 3a DESCRIPTION - Continued

(b) CSM lighting summary - Continued														
SUNRISE			SUNSET			MOONRISE			MOONSET					
D	H	M	S	LONG	D	H	M	S	LONG	D	H	M	S	LONG
1 11 39 53.22	33.04	1 11 3 13.81	-107.79						1 11 28 21.15	-5.33	22.93	23.23		
1 13 9 32.69	10.72	1 12 32 50.28	-130.23		1 12 5 26.79	133.00			1 12 58 10.49	-26.96	23.32	23.60		
1 14 39 10.36	-11.69	1 14 2 28.52	-152.57		1 13 35 15.21	111.53			1 14 27 56.93	-48.78	23.87	24.17		
1 16 8 45.70	-34.22	1 15 32 8.09	-174.63		1 15 5 2.89	90.01			1 15 57 41.41	-70.72	25.09	25.20		
1 17 38 17.68	-56.92	1 17 1 39.51	162.48		1 16 34 49.68	68.43			1 17 27 26.78	-92.60	25.49	25.76		
1 19 7 53.56	-79.42	1 18 31 12.90	139.91		1 18 4 35.39	46.79			1 18 57 12.89	-114.43	26.97	27.03		
1 19 7 51.31	-79.33	1 19 7 59.29	-79.11								26.45	26.68		
1 20 37 45.68	-102.99	1 20 0 54.17	117.82		1 19 34 19.80	25.06					27.37	27.57		
1 22 7 33.54	-125.43	1 21 30 40.64	95.35		1 21 5 4.46	5.53					27.62	27.91		
1 23 37 20.72	-147.89	1 23 0 27.57	72.92		1 22 35 1.86	-16.09					28.00	28.00		
2 1 7 7.09	-170.38	2 0 30 14.89	50.53		2 0 4 59.03	-37.71					28.31	28.54		
2 2 36 49.69	163.76	2 1 59 59.00	27.67		2 1 34 53.99	-59.66					29.06	29.25		
2 4 7 22.96	141.12	2 3 30 32.30	5.08		2 3 5 44.80	-81.06					30.19	30.44		
											30.73	30.82		
											31.13	31.38		
											31.67	31.76		
											32.31	32.61		
											32.68	33.01		
											33.24	33.56		
											33.63	34.20		
											34.49	34.49		

TABLE VI.- ALTERNATE MISSION 3a DESCRIPTION - Continued

SUNRISE			SUNSET			MOONRISE			MOONSET			REVOLUTION				
D	H	M	S	LONG		D	H	M	S	LONG		D	H	M	S	LONG
2	5	37	56.79	118.52		2	6	31	33.90	-40.33		2	6	7	2.83	-125.32
2	7	8	26.79	95.07		2	8	2	2.92	-63.11		2	7	37	55.11	-146.61
2	8	38	54.07	72.81		2	9	32	35.59	-85.66		2	9	8	34.68	-168.68
2	10	9	27.55	50.24		2	11	3	8.80	-108.16		2	10	39	14.27	169.26
2	11	39	59.72	27.61		2	12	33	34.47	-131.08		2	11	32	55.87	6.20
2	13	10	28.44	4.082		2	14	4	2.42	-153.85		2	13	3	34.78	-16.08
2	14	40	54.65	-18.10		2	15	11	21.92	103.67		2	14	34	16.09	-38.21
2	16	11	27.06	-40.66		2	16	34	33.74	-176.41		2	16	5	2.68	-60.06
2	17	41	58.16	-63.27		2	17	5	6.56	161.14		2	16	42	7.49	82.00
2	19	12	36.40	-86.14		2	18	35	44.30	138.78		2	18	12	43.78	59.77
2	20	43	12.05	-109.12		2	21	37	3.29	93.37		2	19	43	29.85	37.46
2	22	13	54.55	-131.71		2	23	7	41.85	70.64		2	22	45	12.91	-6.51
2	23	44	29.63	-154.71								2	23	39	14.67	-170.60

TABLE VI.- ALTERNATE MISSION 3a DESCRIPTION - Continued
 (c) Radar acquisition and loss summary for CSM

MISFN STATION NAME	ACQUISITION DAY HR MIN SEC	LOSS DAY HR MIN SEC	ELAPSED TIME MIN SEC	MAX ELEVATION DEG	MAX RANGE N MI	MIN RANGE N MI	REVOLUTION NUMBER
HAW (S) USB-30'	0 2 54	0 3 0 43	5 49	17.21	936.10	371.80	2.85
USS HUNTSVILLE	0 2 58	0 3 6 28	5 49	54.57	888.37	151.86	2.89
GDS (S) USB-85'	0 3 4 28	0 3 11 6	18.70	862.75	340.36	2.97	
GYM (S) USB-30'	0 3 5 23	0 3 12 21	28.08	889.62	249.93	2.97	
WHS-15 (FPS-16M)	0 3 7 32	0 3 13 31	33.06	776.42	218.41	2.99	
TEX (S) USB-30'	0 3 11 12	0 3 15 25	19.80	807.81	329.40	3.02	
MIL (S) USB-30'	0 3 11 55	0 3 19 0	37.04	821.07	204.81	3.05	
GWM (S) USB-30'	0 3 14 46	0 3 22 17	24.65	782.74	285.70	3.05	
BDA (S) USB-30'	0 3 16 57	0 3 24 13	16.67	580.05	386.92	3.08	
ANG-91 USB-30	0 3 18 44	0 3 24 34	12.20	635.41	478.29	3.10	
USS VANGUARD	0 3 30 32	0 3 38 53	4.24	942.36	747.68	3.12	
ACN (S) USB-30'	0 3 30 30	0 3 40 10	20.13	939.39	381.71	3.24	
CRO (S) USB-30'	0 4 1 51	0 0 0 4	45.89	963.96	209.06	3.59	
GWM (S) USB-30'	0 4 17 45	0 0 0 4	8.53	940.00	940.00	3.67	
HAW (S) USB-30'	0 4 27 42	0 0 0 4	.52	22.52	293.64	3.83	
USS HUNTSVILLE	0 4 33 38	0 0 0 4	7.52	12.39	449.79	3.91	
GDS (S) USB-85'	0 4 37 32	0 0 0 4	7.51	841.16	294.99	3.95	
GYM (S) USB-30'	0 4 39 17	0 0 0 4	22.86	748.09	317.72	3.98	
WHS-15 (FPS-16M)	0 4 40 8	0 0 0 4	20.86	748.09	317.72	3.98	
TEX (S) USB-30'	0 4 42 21	0 0 0 4	44.25	895.50	177.52	4.02	
MIL (S) USB-30'	0 4 46 0	0 0 0 4	61.57	946.65	145.16	4.04	
GWM (S) USB-30'	0 4 46 37	0 0 0 4	21.74	885.92	322.44	4.04	
BDA (S) USB-30'	0 4 51 7	0 0 0 4	27.62	908.85	267.82	4.06	
ANG-91 USB-30	0 4 51 7	0 0 0 4	1.64	951.85	876.42	4.06	
ACN (S) USB-30'	0 5 5 9	0 0 0 4	25.05	731.54	298.40	4.09	
CRO (S) USB-30'	0 5 37 52	0 0 0 5	61.57	946.65	145.16	4.09	
GWM (S) USB-30'	0 5 48 51	0 0 0 5	21.74	885.92	322.44	4.09	
HAW (S) USB-30'	0 6 3 24	0 0 0 5	27.62	908.85	267.82	4.09	
USS HUNTSVILLE	0 6 8 44	0 0 0 6	8.35	770.97	552.86	4.09	
GDS (S) USB-85'	0 6 12 34	0 0 0 6	14.97	632.82	403.24	4.09	
GYM (S) USB-30'	0 6 14 0	0 0 0 6	14.89	817.15	483.99	4.09	
WHS-15 (FPS-16M)	0 6 14 55	0 0 0 6	4.55	961.53	777.31	4.09	
MIL (S) USB-30'	0 6 22 15	0 0 0 6	27.22	810.73	266.06	4.09	
TEX (S) USB-30'	0 6 17 5	0 0 0 6	8.36	908.85	267.82	4.09	
GWM (S) USB-30'	0 6 22 54	0 0 0 6	3.25	770.97	552.86	4.09	
HAW (S) USB-30	0 6 17 5	0 0 0 6	25.05	731.54	298.40	4.09	
GDS (S) USB-85'	0 6 19 48	0 0 0 6	12.82	892.79	452.64	4.09	
GYM (S) USB-30'	0 6 22 10	0 0 0 6	44.67	879.54	181.87	4.09	
WHS-15 (FPS-16M)	0 6 22 12	0 0 0 6	7.7	687.90	457.68	4.09	
MIL (S) USB-30'	0 6 26 15	0 0 0 6	2.09	960.79	861.15	5.00	
TEX (S) USB-30'	0 6 24 48	0 0 0 6	15.49	892.79	412.11	5.00	
GWM (S) USB-30'	0 6 27 9	0 0 0 6	2.36	895.71	847.69	5.02	
ANG-91 USB-30	0 6 31 54	0 0 0 6	2.19	936.40	883.39	5.05	
ACN (S) USB-30'	0 6 45 20	0 0 0 6	4.6	1026.34	5.19	5.19	
USS MERCURY	0 6 22 3	0 0 0 7	4.73	910.26	702.39	5.62	
GWM (S) USB-30'	0 7 24 15	0 0 0 7	9.57	932.44	523.08	5.67	
HAW (S) USB-30'	0 7 24 15	0 0 0 7	7.70	800.66	581.97	5.67	

TABLE VI. - ALTERNATE MISSION 3a DESCRIPTION - Continued

(c) Radar acquisition and loss summary for CSM - Continued

MSFN STATION	NAME	ACQUISITION			LOSS	DAY	HR	MIN	SEC	ELAPSED TIME	MAX ELEVATION	DEG	N MI	N MI	MIN RANGE	REVOLUTION NUMBER
		DAY	HR	MIN												
GDS (S) USB-85*	0	7	48	49	0	7	51	51	2	3	1.50	874.90	5.90	874.90	874.47	25.19
USS HUNTSVILLE	0	7	43	16	0	7	51	33	8	17	25.19	726.93	5.90	726.93	639.47	25.19
GYM (S) USB-30*	0	7	49	19	0	7	55	39	6	19	6.96	804.45	5.94	804.45	639.97	6.96
MERCURY (S) USB-30*	0	8	55	11	0	9	3	18	8	7	25.74	734.19	6.63	734.19	268.02	6.63
HAW (S) USB-30*	0	9	13	7	0	9	21	1	7	53	18.45	833.09	6.84	833.09	354.31	6.84
USS HUNTSVILLE	0	9	18	14	0	9	25	48	7	34	14.49	939.58	6.88	939.58	437.48	6.88
USS MERCURY	0	10	30	17	0	10	37	52	7	34	19.36	922.49	7.62	922.49	330.22	7.62
HAW (S) USB-30*	0	10	47	43	0	10	55	52	8	9	24.02	834.61	7.82	834.61	303.46	7.82
USS REDSTONE	0	11	5	6	0	11	10	0	4	53	2.84	904.77	7.95	904.77	890.99	7.95
USS MERCURY	0	12	5	27	0	12	12	43	7	15	11.87	870.28	8.64	870.28	462.13	8.64
HAW (S) USB-30*	0	12	24	55	0	12	27	23	2	27	1.09	925.15	8.78	925.15	925.15	8.78
USS REDSTONE	0	12	37	23	0	12	46	22	8	59	31.17	1065.82	8.97	1065.82	293.30	8.97
ACN (S) USB-30*	0	13	4	20	0	13	11	47	7	27	10.90	749.46	9.23	749.46	556.32	9.23
MERCURY (S) USB-30*	0	13	40	12	0	13	48	5	7	53	26.73	912.20	9.62	912.20	265.59	9.62
GWM (S) USB-30*	0	13	46	19	0	13	53	23	7	4	10.01	946.76	9.68	946.76	537.45	9.68
USS REDSTONE	0	14	12	7	0	14	21	15	9	7	32.59	1025.63	9.96	1025.63	288.17	9.96
ACN (S) USB-30*	0	14	38	33	0	14	46	58	8	25	29.91	842.64	10.23	842.64	266.92	10.23
MERCURY (S) USB-30*	0	15	14	45	0	15	22	51	8	6	26.59	874.66	10.62	874.66	274.02	10.62
GWM (S) USB-30*	0	15	20	24	0	15	28	46	8	21	39.78	918.61	10.67	918.61	209.86	10.67
USS REDSTONE	0	15	47	23	0	15	56	3	8	40	17.17	699.25	10.95	699.25	462.83	10.95
CYI (S) USB-30*	0	16	21	46	0	16	22	44	0	58	.42	920.79	11.22	920.79	920.79	11.22
USS MERCURY	0	16	51	19	0	16	55	2	3	13	1.68	908.87	11.58	908.87	879.63	11.58
GWM (S) USB-30*	0	16	57	51	0	17	0	45	1	19	970.04	11.63	970.04	934.63	11.63	
USS REDSTONE	0	17	22	26	0	17	31	20	8	54	23.54	854.51	11.96	854.51	365.27	11.96
CYI (S) USB-30*	0	17	52	37	0	18	0	12	7	34	19.24	601.47	12.23	601.47	335.61	12.23
MAD (S) USB-85*	0	17	58	7	0	18	1	43	3	35	1.93	903.35	12.25	903.35	818.58	12.25
CNB (S) USB-85*	0	18	38	29	0	18	43	57	5	27	3.47	887.68	12.69	887.68	868.39	12.69
USS REDSTONE	0	18	57	7	0	19	6	10	9	3	42.92	814.92	13.01	814.92	221.59	13.01
ANG-91 USB-30	0	19	15	58	0	19	23	34	7	35	15.10	902.35	13.11	902.35	411.37	13.11
USS VANGUARD	0	19	22	47	0	19	26	39	3	51	2.18	894.34	13.15	894.34	816.43	13.15
CYI (S) USB-30*	0	19	26	58	0	19	35	2	8	3	31.42	790.55	13.24	790.55	226.16	13.24
MAD (S) USB-85*	0	19	30	54	0	19	37	10	6	16	7.54	789.50	13.27	789.50	579.28	13.27
CRO (S) USB-30*	0	20	5	31	0	20	10	42	7	31	9.84	995.79	13.61	995.79	610.29	13.61
CNB (S) USB-85*	0	20	11	6	0	20	19	43	8	34	15.27	837.70	13.70	837.70	497.12	13.70
USS REDSTONE	0	20	32	53	0	20	39	20	6	26	6.55	852.96	13.92	852.96	700.89	13.92
MIL (S) USB-30*	0	20	50	5	0	20	53	18	3	14	1.44	919.57	14.05	919.57	860.92	14.05
GBM (S) USB-30*	0	20	49	14	0	20	54	47	5	32	4.97	870.47	14.07	870.47	691.86	14.07
ANG-91 USB-30	0	20	50	29	0	20	58	12	7	42	22.05	572.45	14.09	572.45	304.91	14.09
BDA (S) USB-30*	0	20	52	34	0	20	59	21	5	47	5.13	926.51	14.11	926.51	675.59	14.11
USS VANGUARD	0	20	55	6	0	21	2	37	7	30	16.24	875.10	14.16	875.10	376.40	14.16
CYI (S) USB-30*	0	21	2	1	0	21	9	48	6	22	22.60	870.86	14.24	870.86	294.02	14.24
MAD (S) USB-85*	0	21	5	0	21	11	21	1	7	80	767.97	14.56	767.97	574.12	14.56	
CRO (S) USB-30*	0	21	36	48	0	21	46	4	9	16	35.06	725.66	14.60	725.66	269.40	14.60
CNB (S) USB-85*	0	21	43	17	0	21	54	20	9	2	29.89	1066.76	14.72	1066.76	307.83	14.72
TEX (S) USB-30*	0	22	19	29	0	22	25	28	5	58	6.23	819.76	15.01	819.76	640.87	15.01
MIL (S) USB-30*	0	22	22	14	0	22	29	54	7	40	21.80	925.40	15.05	925.40	304.63	15.05
GBM (S) USB-30*	0	22	22	24	0	22	30	18	0	22	46.04	516.10	15.05	516.10	170.11	15.05
ANG-91 USB-30	0	22	27	4	0	22	31	48	4	44	2.99	783.04	15.08	783.04	764.92	15.08
BDA (S) USB-30*	0	22	33	43	0	22	33	43	7	49	24.11	848.36	15.10	848.36	279.05	15.10

TABLE VI.- ALTERNATE MISSION 3a DESCRIPTION - Continued

MSFN STATION NAME	ACQUISITION			LOSS			ELAPSED TIME			MAX ELEVATION			MAX RANGE			MIN RANGE			REVOLUTION NUMBER		
	DAY	HR	MIN	SEC	DAY	HR	MIN	SEC	MIN	SEC	DEG	MIN	SEC	DEG	MIN	SEC	DEG	MIN	SEC	DEG	
USS VANGUARD (S) USB-85'	22	29	21		0	22	44	14	26		8	4	3	25.62	733.48	265.98	15.15				
MAD (S) USB-30'	0	22	40	11	0	22	44	46	4	4	2.34	4	3	915.95	809.06	15.22					
CYI (S) USB-30'	0	22	35	41	0	22	44	46	8	51	41.15	4	4	861.06	185.97	15.24					
CRO (S) USB-85'	0	23	11	54	0	23	20	46	8	51	992.72	22.77	23.88	1001.79	361.06	15.61					
CNB (S) USB-30'	0	23	19	57	0	23	28	43	8	46	669.72	422.80	422.80	13.91	15.97	15.97					
GYM (S) USB-30'	0	23	50	27	0	23	57	44	7	17	924.58	573.52	573.52	14.20	15.99	15.99					
WHS-15 (FPS-16M)	0	23	52	14	0	23	58	40	6	25	35.45	821.29	207.35	14.21	16.02	16.02					
TEX (S) USB-30'	0	23	52	49	1	0	0	52	8	3	44.65	877.58	172.08	14.22	16.07	16.07					
MIL (S) USB-30'	0	23	56	37	1	0	4	35	7	58	20.15	796.87	320.29	14.23	16.07	16.07					
GBM (S) USB-30'	0	23	57	10	1	0	5	1	7	50	0.19	915.00	915.00	14.24	16.07	16.07					
ANG-91 USB-30'	1	0	4	11	1	0	0	4	54	0	42	72.28	488.11	128.94	14.25	16.09	16.09				
BDA (S) USB-30'	1	0	0	23	1	0	8	17	7	54	72.28	488.11	128.94	14.26	16.09	16.09					
USS VANGUARD	1	0	4	1	1	0	12	1	7	59	42.17	870.16	181.33	14.27	16.14	16.14					
CYI (S) USB-30'	1	0	11	25	1	1	0	19	16	50	15.78	782.28	395.94	14.28	16.22	16.22					
CRO (S) USB-30'	1	0	47	7	1	1	0	55	48	8	41	16.17	847.78	478.93	14.29	16.60	16.60				
CNB (S) USB-85'	1	0	56	6	1	1	2	6	7	0	7.90	868.63	680.57	14.30	16.66	16.66					
HAW (S) USB-30'	1	1	15	37	1	1	19	20	3	43	1.72	884.56	855.50	14.31	16.83	16.83					
USS HUNTSVILLE	1	1	18	55	1	1	26	37	7	42	18.90	878.08	344.60	14.32	16.91	16.91					
GDS (S) USB-85'	1	1	23	24	1	1	31	14	7	50	9.82	848.91	510.79	14.33	16.96	16.96					
GYM (S) USB-30'	1	1	23	56	1	1	32	33	8	36	58.17	883.95	144.29	14.34	16.99	16.99					
WHS-15 (FPS-16M)	1	1	25	39	1	1	33	47	8	3	29.37	845.59	237.15	14.35	16.99	16.99					
TEX (S) USB-30'	1	1	27	39	1	1	35	34	7	54	22.73	801.46	291.62	14.36	17.01	17.01					
MIL (S) USB-30'	1	1	31	30	1	1	39	27	7	56	21.28	767.93	308.40	14.37	17.06	17.06					
GBM (S) USB-30'	1	1	32	20	1	1	41	39	54	7	34	19.17	624.80	333.62	14.38	17.06	17.06				
BDA (S) USB-30'	1	1	34	54	1	1	42	57	8	2	31.11	820.42	230.02	14.39	17.10	17.10					
ANG-91 USB-30'	1	1	34	55	1	1	42	53	4	47	3.40	897.76	753.81	14.40	17.10	17.10					
USS VANGUARD	1	1	38	45	1	1	46	8	7	23	14.88	636.48	408.05	14.41	17.13	17.13					
CYI (S) USB-30'	1	1	48	12	1	1	50	51	2	39	.76	949.57	925.35	14.42	17.18	17.18					
ACN (S) USB-30'	1	1	53	25	1	1	56	40	3	15	1.32	962.55	911.61	14.43	17.24	17.24					
CKO (S) USB-30'	1	2	22	1	2	47	2	55	36	7	49	33.88	1057.34	265.80	14.44	17.59	17.59				
HAW (S) USB-30'	1	2	47	47	1	2	55	36	7	49	27.45	829.23	243.65	14.45	17.84	17.84					
USS HUNTSVILLE	1	2	53	16	1	3	1	15	7	59	34.01	942.83	219.05	14.46	17.91	17.91					
GDS (S) USB-85'	1	2	57	55	1	3	6	11	8	16	20.86	793.86	338.61	14.47	17.96	17.96					
GYM (S) USB-30'	1	2	59	9	1	3	11	3	15	29.49	953.79	268.30	14.48	17.99	17.99						
WHS-15 (FPS-16M)	1	2	59	56	1	3	11	3	8	43	31.39	730.71	262.85	14.49	17.99	17.99					
TEX (S) USB-30'	1	3	2	4	1	3	10	45	8	41	24.51	785.84	330.30	14.50	18.01	18.01					
MIL (S) USB-30'	1	3	5	37	1	3	14	48	9	11	32.28	717.67	275.63	14.51	18.05	18.05					
GBM (S) USB-30'	1	3	6	18	1	3	15	30	9	11	53.37	1015.65	196.80	14.52	18.07	18.07					
BDA (S) USB-30'	1	3	9	13	1	3	17	30	8	17	14.59	1035.54	516.18	14.53	18.09	18.09					
ANG-91 USB-30'	1	3	11	6	1	3	20	15	9	9	25.38	898.18	361.30	14.54	18.11	18.11					
USS VANGUARD	1	3	14	1	3	19	23	5	21	3.42	1082.81	921.58	14.55	18.11	18.11						
ACN (S) USB-30'	1	3	24	46	1	3	34	54	10	8	42.50	1092.09	277.66	14.56	18.23	18.23					
CRO (S) USB-30'	1	3	35	35	1	4	52	8	16	22.36	1042.95	872.12	14.57	18.57	18.57						
GWM (S) USB-30'	1	4	11	41	1	4	16	30	5	22	4.51	872.12	712.75	14.58	18.67	18.67					
HAW (S) USB-30'	1	4	23	33	1	4	30	39	7	6	16.08	799.95	354.61	14.59	18.82	18.82					
USS HUNTSVILLE	1	4	29	27	1	4	36	15	6	47	12.35	857.11	420.07	14.60	18.90	18.90					
GDS (S) USB-85'	1	4	33	40	1	4	40	7	15	21.32	765.10	285.03	14.61	18.95	18.95						
GYM (S) USB-30'	1	4	34	58	1	4	42	31	7	33	35.28	870.94	192.68	14.62	18.97	18.97					
WHS-15 (FPS-16M)	1	4	43	43	1	4	43	43	7	7	28.18	870.91	229.43	14.63	18.98	18.98					

TABLE VI. - ALTERNATE MISSION 3a DESCRIPTION - Continued

(c) Radar acquisition and loss summary for CSM - Continued

MSFN STATION NAME	ACQUISITION DAY HR MIN SEC	LOSS DAY HR MIN SEC	ELAPSED TIME MIN SEC	MAX ELEVATION DEG	MAX RANGE NM	MIN RANGE NM	REVOLUTION NUMBER
TEX (S) USB-30 [*]	1 4 37 54	1 4 41 46	4 45 34	49.39	151.42	19.00	
MIL (S) USB-30 [*]	1 1 4 42 23	1 1 4 49 26	7 50	11.99	442.84	19.03	
GBM (S) USB-30 [*]	1 1 4 46 57	1 1 4 54 19	7 3	13.94	852.99	19.04	
ANG-91 (S) USB-30 [*]	1 1 5 1 13	1 1 5 8 6	16.04	916.66	379.60	19.08	
ACK (S) USB-30 [*]	1 1 5 34 49	1 1 5 36 38	6 53	8.54	996.76	19.21	
CRO (S) USB-30 [*]	1 1 5 43 52	1 1 5 52 0	1 49	4.43	983.36	19.53	
GWM (S) USB-30 [*]	1 1 5 53 50	1 1 6 4 58	8 8	74.26	938.86	132.82	19.66
HAW (S) USB-30 [*]	1 1 6 5 51	1 1 6 11 19	6 7	6.46	908.41	610.67	19.82
USS HUNTSVILLE	1 1 6 7 52	1 1 6 14 20	6 28	16.55	903.49	366.85	19.91
GDS (S) USB-85 [*]	1 1 6 9 13	1 1 6 16 58	7 44	8.46	739.38	551.17	19.93
GYM (S) USB-30 [*]	1 1 6 10 22	1 1 6 16 38	6 16	25.66	796.74	269.08	19.95
WHS-15 (FPS-164)	1 1 6 12 34	1 1 6 18 2	5 28	7.33	591.47	132.82	19.95
TEX (S) USB-30 [*]	1 1 6 16 12	1 1 7 23	5 57	10.31	950.42	570.30	19.98
USS MERCURY	1 1 7 19 49	1 1 7 25 35	5 46	5.20	750.09	513.32	20.63
GWM (S) USB-30 [*]	1 1 7 33 45	1 1 7 40 21	6 36	7.70	905.78	677.79	20.65
HAW (S) USB-30 [*]	1 1 7 38 18	1 1 7 46 21	8 2	65.77	881.54	569.23	20.84
USS HUNTSVILLE	1 1 7 49 20	1 1 7 49 11	3 51	1.89	895.16	135.86	20.90
GYM (S) USB-30 [*]	1 1 8 50 6	1 1 8 58 2	7 56	67.64	859.95	843.42	20.92
USS MERCURY	1 1 8 56 2	1 1 9 15 54	7 52	35.50	913.04	134.24	21.62
HAW (S) USB-30 [*]	1 1 9 13 31	1 1 9 19 50	6 19	7.00	844.62	206.42	21.83
USS HUNTSVILLE	1 1 9 25 7	1 1 10 32 30	7 23	13.61	846.25	420.32	21.86
USS MERCURY	1 1 10 42 43	1 1 10 50 0	7 17	13.39	682.25	438.21	22.63
HAW (S) USB-30 [*]	1 1 10 56 44	1 1 11 5 23	6 39	7.29	833.21	673.13	22.95
USS REDSTONE	1 1 11 26 3	1 1 11 28 23	2 50	1.95	1040.45	982.14	23.23
ACN (S) USB-30 [*]	1 1 12 0 12	1 1 12 7 27	7 14	13.98	671.30	410.74	23.62
USS MERCURY	1 1 12 7 54	1 1 12 10 38	2 44	.83	904.56	880.31	23.67
GWM (S) USB-30 [*]	1 1 12 31 56	1 1 12 40 55	8 59	59.77	991.87	176.48	23.96
USS REDSTONE	1 1 12 58 23	1 1 13 6 44	8 20	19.37	878.18	389.54	24.24
ACN (S) USB-30 [*]	1 1 13 34 35	1 1 13 42 36	8 0	34.53	837.34	209.04	24.63
USS MERCURY	1 1 13 40 29	1 1 13 48 4	7 35	18.04	618.75	355.88	24.67
GWM (S) USB-30 [*]	1 1 14 6 41	1 1 14 15 31	8 50	19.25	776.36	413.63	24.95
USS REDSTONE	1 1 14 13 40	1 1 16 18 48	5 8	12.84	835.33	485.33	25.22
ACN (S) USB-30 [*]	1 1 14 17 31	1 1 17 14 41	0 2	12.15	824.59	459.31	25.61
USS MERCURY	1 1 15 9 22	1 1 15 16 46	7 24	14.97	867.76	417.00	25.66
GWM (S) USB-30 [*]	1 1 15 14 58	1 1 15 22 40	7 42	14.97	1019.04	440.29	25.97
USS REDSTONE	1 1 15 41 52	1 1 15 50 21	8 28	17.92	899.16	738.40	26.24
CYI (S) USB-30 [*]	1 1 16 13 40	1 1 16 18 48	5 8	4.08	741.50	351.71	26.95
USS REDSTONE	1 1 17 16 31	1 1 17 17 25	34 9	2.46	28.77	882.30	299.30
ANG-91 (S) USB-30 [*]	1 1 17 37 53	1 1 17 40 40	2 47	.85	963.76	926.39	27.10
CYI (S) USB-30 [*]	1 1 17 46 28	1 1 17 54 25	7 57	30.66	864.10	235.09	27.25
MAD (S) USB-85 [*]	1 1 17 51 26	1 1 17 56 22	4 56	3.84	883.53	724.87	27.27
CNB (S) USB-85 [*]	1 1 18 31 48	1 1 18 38 22	6 34	5.85	1004.34	740.83	27.71
USS REDSTONE	1 1 18 51 12	1 1 18 59 59	8 46	28.77	882.30	299.30	27.93
ANG-91 (S) USB-30 [*]	1 1 19 9 36	1 1 19 17 46	8 10	32.79	881.09	231.88	28.10
USS VANGUARD	1 1 19 15 37	1 1 19 21 22	5 45	5.49	876.24	669.72	28.14
CYI (S) USB-30 [*]	1 1 19 21 2	1 1 19 29 1	7 58	21.20	738.89	307.97	28.24
MAD (S) USB-85 [*]	1 1 19 24 40	1 1 19 31 4	6 24	8.24	756.28	551.41	28.27
CRO (S) USB-30 [*]	1 1 19 56 45	1 1 20 5 7	8 21	15.88	995.71	458.49	28.60
CNB (S) USB-85 [*]	1 1 20 4	1 1 20 14 2	9 19	1154.40	434.55	28.72	

TABLE VI.- ALTERNATE MISSION 3a DESCRIPTION - Continued

(c) Radar acquisition and loss summary for CSM - Continued

MSFN STATION NAME	ACQUISITION			LOSS			ELAPSED TIME			MAX ELEVATION			MIN RANGE			REVOLUTION NUMBER	
	DAY	HR	MIN	SEC	DAY	HR	MIN	SEC	MIN	SEC	DEG	N	MI	N	MI	N	MI
USS REDSTONE (S) USB-30'	1	20	27	23	1	20	33	6	5	42	3.91	1070.64	922.48	28.90	29.06	29.06	29.06
MIL (S) USB-30'	1	20	43	2	1	20	48	53	5	51	5.68	847.11	679.62	29.06	29.06	29.06	29.06
GBM (S) USB-30'	1	20	42	43	1	20	49	43	7	0	10.23	770.47	528.41	29.10	29.10	29.10	29.10
BDA (S) USB-30'	1	20	46	23	1	20	52	59	6	35	9.30	717.65	499.72	29.10	29.10	29.10	29.10
ANG-91 USB-30	1	20	45	12	1	20	52	20	7	7	10.56	828.40	830.89	29.12	29.15	29.15	29.15
USS VANGUARD (S) USB-30'	1	20	49	32	1	20	56	51	7	19	18.26	605.82	251.12	29.12	29.23	29.23	29.25
CYI (S) USB-30'	1	20	56	47	1	21	3	44	6	56	21.03	736.34	631.75	29.23	29.25	29.25	29.25
MAU (S) USB-85'	1	21	0	8	1	21	4	30	4	22	3.51	1071.63	245.93	29.61	29.61	29.61	29.61
CRO (S) USB-30'	1	21	30	47	1	21	40	22	9	34	43.43	986.77	317.39	29.71	29.71	29.71	29.71
CNB (S) USB-85'	1	21	39	1	1	21	48	57	9	55	34.86	99.17	846.24	29.97	29.97	29.97	29.97
GYM (S) USB-30'	1	22	11	56	1	22	16	14	4	18	2.46	949.96	949.96	29.97	29.97	29.97	29.97
WHS-15 (FPS-16M)	1	22	15	46	1	22	16	5	0	18	.11	851.13	531.47	30.02	30.02	30.02	30.02
TEX (S) USB-30'	1	22	13	12	1	22	22	20	7	7	10.05	826.04	235.93	30.07	30.07	30.07	30.07
MIL (S) USB-30'	1	22	19	30	1	22	24	13	7	43	28.63	724.52	255.89	30.07	30.07	30.07	30.07
GBM (S) USB-30'	1	22	16	50	1	22	24	43	7	53	25.86	803.27	803.27	30.07	30.07	30.07	30.07
ANG-91 USB-30	1	22	22	57	1	22	25	12	2	14	1.15	572.47	196.83	30.09	30.09	30.09	30.09
BDA (S) USB-30'	1	22	25	40	1	22	27	49	7	24	32.11	518.09	128.20	30.14	30.14	30.14	30.14
USS VANGUARD (S) USB-30'	1	22	24	10	1	22	31	27	7	16	51.02	747.84	229.93	30.23	30.23	30.23	30.23
CYI (S) USB-30'	1	22	31	38	1	22	38	38	6	59	22.48	889.95	438.17	30.60	30.60	30.60	30.60
CRO (S) USB-30'	1	23	0	0	1	23	15	26	9	25	21.61	1123.33	472.35	30.69	30.69	30.69	30.69
CNB (S) USB-85'	1	23	47	47	1	23	23	19	9	32	20.72	799.80	790.62	30.89	30.89	30.89	30.89
USS HUNTSVILLE (S) USB-30'	1	23	40	5	1	23	45	33	5	28	3.85	907.85	809.14	30.96	30.96	30.96	30.96
GDS (S) USB-85'	1	23	46	4	1	23	50	0	3	56	2.18	833.59	326.15	30.98	30.98	30.98	30.98
GYM (S) USB-30'	1	23	44	36	1	23	52	17	7	41	19.94	641.72	435.91	30.98	30.98	30.98	30.98
WHS-15 (FPS-16M)	1	23	46	21	1	23	53	18	6	56	12.21	836.01	160.80	31.01	31.01	31.01	31.01
TEX (S) USB-30'	1	23	47	28	1	23	55	16	7	48	43.72	795.17	242.52	31.67	31.67	31.67	31.67
MIL (S) USB-30'	1	23	51	29	1	23	58	51	7	21	23.53	595.08	291.29	31.06	31.06	31.06	31.06
GBM (S) USB-30'	1	23	52	10	1	23	59	13	7	2	18.62	748.66	238.58	31.11	31.11	31.11	31.11
BDA (S) USB-30'	1	23	55	10	2	0	2	20	7	10	23.05	614.12	225.42	31.13	31.13	31.13	31.13
USS VANGUARD (S) USB-30'	1	23	58	55	2	1	23	53	6	54	23.37	749.01	488.78	31.21	31.21	31.21	31.21
CYI (S) USB-30'	2	0	6	45	2	0	12	0	5	45	25.52	1015.75	406.15	31.61	31.61	31.61	31.61
CRO (S) USB-30'	2	0	41	1	2	0	50	49	9	48	6.03	1087.17	861.16	31.67	31.67	31.67	31.67
CNB (S) USB-85'	2	0	49	16	2	0	56	25	7	8	7.76	808.40	638.86	31.83	31.83	31.83	31.83
HAW (S) USB-30'	2	1	8	34	2	1	15	16	6	41	32.09	841.73	223.70	32.00	32.00	32.00	32.00
USS HUNTSVILLE (S) USB-30'	2	1	13	16	2	1	21	21	8	5	32.09	705.06	425.47	31.95	31.95	31.95	31.95
GDS (S) USB-85'	2	1	18	51	2	1	25	38	6	45	11.86	794.96	225.06	31.97	31.97	31.97	31.97
GYM (S) USB-30'	2	1	19	23	2	1	26	57	7	33	26.93	602.95	189.64	31.97	31.97	31.97	31.97
WHS-15 (FPS-16M)	2	1	20	35	2	1	27	57	7	21	33.05	601.66	257.43	31.97	31.97	31.97	31.97
TEX (S) USB-30'	2	1	22	37	2	1	29	44	7	7	15.79	699.53	310.21	31.96	31.96	31.96	31.96
GBM (S) USB-30'	2	1	27	16	2	1	27	20	0	4	31.00	742.76	181.79	32.00	32.00	32.00	32.00
MIL (S) USB-30'	2	1	26	30	2	1	26	35	0	5	6.19	835.95	569.83	31.94	31.94	31.94	31.94
GDS (S) USB-85'	2	1	25	35	2	1	25	34	0	-1	25.04	824.96	238.32	31.96	31.96	31.96	31.96
GYM (S) USB-30'	2	1	26	51	2	1	26	49	0	-1	42.19	830.78	154.87	31.97	31.97	31.97	31.97
WHS-15 (FPS-16M)	2	1	27	56	2	1	27	55	0	-1	22.88	824.99	245.63	32.00	32.00	32.00	32.00
TEX (S) USB-30'	2	1	29	41	2	1	29	38	0	-3	6.50	51.04	838.34	32.06	32.06	32.06	32.06
MIL (S) USB-30'	2	1	26	37	2	1	33	27	6	40	19.09	829.86	265.91	32.06	32.06	32.06	32.06
GBM (S) USB-30'	2	1	27	21	2	1	34	2	2	1	15.99	820.84	288.96	32.06	32.06	32.06	32.06
BDA (S) USB-30'	2	1	30	6	2	1	36	29	6	22	4.01	776.89	574.65	32.10	32.10	32.10	32.10
ANG-91 USB-30	2	1	32	1	2	1	37	25	4	30	4.01						

TABLE VI.- ALTERNATE MISSION 3a DESCRIPTION - Continued

(c) Radar acquisition and loss summary for CSM - Continued

MSFN STATION NAME	ACQUISITION, DAY HR MIN SEC	LOSS DAY HR MIN SEC	ELAPSED TIME MIN SEC	MAX ELEVATION DEG	MAX RANGE N MI	MIN RANGE N MI	REVOLUTION NUMBER
USS VANGUARD ACN (S) USB-30 ¹	34 9	30 56	3 56	2.97	613.05	32.10	
CRO (S) USB-30 ¹	46 21	52 6	6 6	8.10	702.63	32.23	
GWM (S) USB-30 ¹	2 31	26 54	11 33	8.35	507.51	32.60	
HAW (S) USB-30 ¹	42 31	2 2	5 5	2.34	944.47	32.66	
USS HUNTSVILLE GDS (S) USB-85 ¹	2 49	51 35	9 4	41.47	1128.10	32.84	
GYM (S) USB-30 ¹	2 38	55 38	7 36	16.94	232.80	32.89	
WHS-15 (FPS-16 ^M)	2 16	3 0	7 18	23.12	377.54	32.94	
TEX (S) USB-30 ¹	56 2	57 2	7 7	21.61	648.77	32.94	
MIL (S) USB-30 ¹	2 9	2 3	7 7	542.79	258.11	32.97	
GWM (S) USB-30 ¹	2 38	2 3	23 23	24.38	758.38	32.99	
ANG-91 USB-30 ¹	56 1	2 2	3 3	16.57	739.55	33.01	
ACN (S) USB-30 ¹	25 25	3 5	6 52	20.90	636.46	33.03	
CRU (S) USB-30 ¹	46 9	2 3	6 37	20.90	228.61	33.05	
GWM (S) USB-30 ¹	2 56	2 3	9 29	19.77	784.97	33.05	
BDA (S) USB-30 ¹	2 21	2 3	9 9	.23	755.31	33.05	
ANG-91 USB-30 ¹	2 7	2 3	14 14	56.55	542.14	102.58	
ACN (S) USB-30 ¹	20 44	2 3	28 38	20.26	834.22	341.40	
CRU (S) USB-30 ¹	51 32	2 4	1 38	1171.80	674.47	33.58	
GWM (S) USB-30 ¹	2 4	2 4	14 11	10.9	1063.57	373.16	
HAW (S) USB-30 ¹	2 19	2 4	26 24	6 55	9.64	749.21	
USS HUNTSVILLE	28 32	2 4	32 1	6 28	10.39	646.09	437.62
GDS (S) USB-85 ¹	29 28	2 4	35 44	6 15	651.52	369.96	
GWM (S) USB-30 ¹	31 4	2 4	37 54	6 49	37.69	595.68	142.42
WHS-15 (FPS-16 ^M)	31 55	2 4	38 44	6 8	60.9	350.18	33.97
TEX (S) USB-30 ¹	2 34	2 4	40 30	6 22	15.62	626.01	281.37
MIL (S) USB-30 ¹	39 30	2 4	41 31	1 32	.74	727.59	32.99
GWM (S) USB-30 ¹	40 9	2 4	42 34	2 24	1.32	696.45	34.01
ANG-91 USB-30 ¹	44 39	2 4	47 32	2 53	762.97	754.77	34.06
ACN (S) USB-30 ¹	58 33	2 4	52 28	3 55	1.96	979.44	965.33
USS MERCURY	19 15	2 5	45 36	7 17	6.33	1101.98	827.06
GWM (S) USB-30 ¹	38 19	2 2	50 41	20.08	1024.59	441.26	
HAW (S) USB-30 ¹	40 9	2 2	51 42	5 14	815.09	614.07	
GDS (S) USB-85 ¹	36 27	2 2	52 42	5 0	774.45	774.45	
USS HUNTSVILLE	1 15	2 2	58 6	42 21	589.01	225.93	
GWM (S) USB-30 ¹	7 17	2 6	12 9	51 4.71	598.26	537.77	
GWM (S) USB-30 ¹	7 19	2 6	12 9	1.49	1050.12	928.82	
USS MERCURY	36 0	2 7	22 23	3 23	38.16	1077.90	262.22
HAW (S) USB-30 ¹	32 2	2 7	21 55	9 19	10.52	645.75	383.61
USS MERCURY	37 1	2 7	38 8	6 5	9.70	389.35	383.13
USS HUNTSVILLE	37 1	2 7	43 0	5 58	23.91	1019.59	315.45
USS MERCURY	46 2	2 8	56 5	8 9	24.95	984.54	725.27
HAW (S) USB-30 ¹	46 7	2 8	57 5	6 37	28.18	585.22	36.62
ACN (S) USB-30 ¹	49 7	2 9	57 13	6 37	1.06	1274.74	37.24
USS MERCURY	56 9	2 9	53 26	3 29	11.02	657.32	450.89
HAW (S) USB-30 ¹	25 24	2 10	32 10	6 46	24.95	963.86	325.91
USS REDSTONE	57 12	2 11	5 47	8 34	13.70	171.45	37.97
ACN (S) USB-30 ¹	12 1	2 11	32 59	9 58	15.59	306.66	30.24
USS MERCURY	12 1	2 11	2 12 8	0 6	600.14	619.14	
GWM (S) USB-30 ¹	8 16	2 12	17 12	4 0	2.79	677.13	38.67
USS REDSTONE	32 9	2 12	41 9	42	37.82	1035.28	282.39
ACN (S) USB-30 ¹	58 3	2 13	13 9	20 11	45.62	1171.09	318.12
USS MERCURY	36 59	2 13	43 28	6 29	18.97	792.69	239.79
GWM (S) USB-30 ¹	42 32	2 13	49 26	6 37	21.92	774.76	214.10

TABLE VI.- ALTERNATE MISSION 3a DESCRIPTION - Continued

(c) Radar acquisition and loss summary for CSM - Continued

MSFN STATION NAME	ACQUISITION			LOSS			ELAPSED TIME			MAX ELEVATION			MAX RANGE			MIN RANGE			REVOLUTION NUMBER		
	DAY	HR	MIN	SEC	DAY	HR	MIN	SEC	MIN	SEC	DEG	N MI	N MI	N MI	N MI	N MI	N MI	N MI	N MI	N MI	
USS REDSTONE (S) USB-30'	2 14	7	58		2 14	17	56		9	58	21.64	1093.54	39.97	486.14	40.21	1189.66	916.3	1012.48	40.23	40.57	
ACN (S) USB-30'	2 14	35	31		2 14	43	1		7	29	6.41	1073.01	2.71	758.74	40.62						
CYI (S) USB-30'	2 14	41	46		2 14	46	55		5	9	.06	814.09	614.09	424.56	40.97						
USS MERCURY (S) USB-30'	2 15	14	53		2 15	15	15		0	22	.17	1027.19	1160.21	429.63	41.25						
GWM (S) USB-30'	2 15	20	57		2 15	21	5		0	7	29.54	1011.50	1011.50	847.04	41.27						
USS REDSTONE (S) USB-30'	2 15	43	37		2 15	54	26		10	48	20.69	931.30	931.30	904.78	41.69						
CYI (S) USB-30'	2 16	14	57		2 16	23	58		9	1	3.52	979.59	1172.00	513.04	42.11						
MAD (S) USB-85'	2 16	20	32		2 16	25	38		5	6	4.73	996.23	1016.66	869.14	42.15						
CNB (S) USB-85'	2 17	1	56		2 17	6	24		4	26	1.99	952.91	947.66	892.18	42.17						
USS REDSTONE (S) USB-30'	2 17	19	8		2 17	30	36		11	27	55.22	985.92	1067.51	246.28	41.96						
ANG-91 USB-30	2 17	38	33		2 17	48	19		9	45	57.43	1080.71	1073.18	170.44	42.11						
USS VANGUARD	2 17	45	26		2 17	51	37		6	10	7.80	1016.66	1027.37	607.61	42.26						
MAD (S) USB-85'	2 17	54	39		2 17	54	40		0	0	6.60	947.66	947.66	687.13	42.61						
CYI (S) USB-30'	2 17	50	29		2 17	50	31		0	2	19.44	1122.28	1311.03	481.96	42.72						
USS VANGUARD	2 17	51	38		2 17	51	38		0	0	4.48	1067.51	1080.71	689.52	42.14						
CYI (S) USB-30'	2 17	50	32		2 17	59	12		8	39	57.43	1073.18	1139.71	924.61	42.23						
MAD (S) USB-85'	2 17	54	40		2 18	1	15		6	35	8.11	1027.37	1027.37	756.43	43.07						
CRO (S) USB-30'	2 18	27	31		2 18	34	1		6	30	34.34	986.40	986.40	708.59	43.11						
CIB (S) USB-85'	2 18	34	37		2 18	43	54		9	17	32	1311.03	1311.03	1311.03	42.94						
USS REDSTONE (S) USB-30'	2 18	55	16		2 19	19	5		10	15	15.53	1073.18	1139.71	1139.71	43.07						
MIL (S) USB-30'	2 19	13	23		2 19	19	43		6	20	4.38	1016.66	1016.66	1016.66	43.07						
GBM (S) USB-30'	2 19	12	51		2 19	20	41		7	49	8.49	1016.66	1016.66	1016.66	42.26						
BDA (S) USB-30'	2 19	16	31		2 19	24	6		7	35	8.11	947.66	947.66	947.66	42.61						
ANG-91 USB-30	2 19	14	16		2 19	23	54		9	38	34.34	986.40	986.40	302.74	43.11						
USS VANGUARD	2 19	19	31		2 19	28	3		8	32	19.13	840.10	840.10	416.84	43.16						
CYI (S) USB-30'	2 19	26	58		2 19	34	37		7	39	20.91	914.66	914.66	301.22	43.23						
MAD (S) USB-85'	2 19	30	7		2 19	36	9		6	1	7.54	719.42	719.42	535.05	43.26						
CRO (S) USB-30'	2 19	31	31		2 19	57	9		25	52.49	828.59	828.59	202.85	43.60							
CNB (S) USB-85'	2 19	30	30		2 20	20	2		10	32	32.93	1152.27	1152.27	371.28	43.72						
GYM (S) USB-30'	2 20	43	41		2 20	47	37		3	55	1.57	1141.88	1141.88	1107.16	43.98						
TEX (S) USB-30'	2 20	44	13		2 20	52	20		8	7	9.21	1019.69	1019.69	712.88	44.02						
MIL (S) USB-30'	2 20	47	22		2 20	56	28		9	6	22.92	796.30	796.30	395.72	44.06						
GBM (S) USB-30'	2 20	47	32		2 20	56	55		9	22	33.45	772.77	772.77	280.15	44.06						
ANG-91 USB-30	2 20	52	7		2 20	53	21		6	14	5.72	902.73	902.73	743.46	44.09						
BDA (S) USB-30'	2 20	51	23		2 21	0	0		8	37	27.47	824.48	824.48	305.89	44.11						
USS VANGUARD	2 20	55	13		2 21	3	21		8	7	54.64	1009.29	1009.29	159.36	44.16						
CYI (S) USB-30'	2 21	3	8		2 21	10	18		7	9	26.18	851.57	851.57	215.36	44.23						
MAD (S) USB-85'	2 21	6	55		2 21	9	31		2	36	.73	788.43	788.43	788.43	44.60						
CRO (S) USB-30'	2 21	37	16		2 21	47	4		9	48	25.12	1078.99	1078.99	408.73	44.60						
WHS-15 (FPS-16M)	2 22	18	15		2 22	21	55		10	57	31.72	1228.60	1228.60	403.20	44.71						
TEX (S) USB-30'	2 22	19	7		2 22	24	9		16	38.06	1107.69	1107.69	259.42	45.02							
MIL (S) USB-30'	2 22	23	14		2 22	31	51		8	36	3.37	1135.48	1135.48	1022.47	44.91						
GDS (S) USB-85'	2 22	18	25		2 22	22	47		4	22	2.09	1057.34	1057.34	1022.47	44.91						
GYM (S) USB-30'	2 22	16	22		2 22	25	2		8	57	1005.99	1005.99	994.64	44.95							
WHS-15 (FPS-16M)	2 22	18	15		2 22	26	22		8	7	10.91	964.54	964.54	608.52	44.99						
TEX (S) USB-30'	2 22	19	7		2 22	28	24		9	16	38.06	1107.69	1107.69	259.42	45.02						
MIL (S) USB-30'	2 22	23	14		2 22	31	51		8	36	41.88	1061.64	1061.64	211.50	45.07						
GDS (S) USB-30'	2 22	23	47		2 22	32	12		8	25	21.05	759.55	759.55	359.02	45.09						
BDA (S) USB-30'	2 22	27	17		2 22	35	16		7	59	67.07	996.87	996.87	135.33	45.13						
USS VANGUARD	2 22	31	14		2 22	38	46		7	32	53.15	915.37	915.37	134.21	45.14						

TABLE VI.- ALTERNATE MISSION 3a DESCRIPTION - Concluded
 (c) Radar acquisition and loss summary for CSM - Concluded

MSFN STATION NAME	ACQUISITION			LOSS			ELAPSED TIME MIN SEC	MAX ELEVATION DEG	MAX RANGE N MI	MIN RANGE N MI	REVOLUTION NUMBER
	DAY	HR	MIN SEC	DAY	HR	MIN SEC					
CYI (S) USB-30'	2	22	39	3	2	22	45	27	6	24	12.18
CRO (S) USB-30'	2	23	13	15	2	23	23	32	10	17	20.87
CNB (S) USB-85'	2	23	20	39	2	23	30	51	10	11	16.42
HAW (S) USB-30'	2	23	41	34	2	23	46	39	7	4	6.05
USS HUNTSVILLE	2	23	45	59	2	23	54	47	8	48	24.47
GDS (S) USB-85'	2	23	52	11	2	23	53	42	6	31	9.61
GYM (S) USB-30'	2	23	52	24	2	23	59	54	7	29	67.69
NHS-15 (FPS-16M)	2	23	53	56	3	0	0	52	6	55	50.38

TABLE VII.- ALTERNATE MISSION 3b DESCRIPTION

(a) Maneuver plan

Event	Rev no	E.e.t., day:hr:min	Burn time, sec	ΔV , fps			IMU alignment	Resultant ellipse, h_a/h_p , n. mi.	TVC mode		Station contact	Comments
				Total	ΔV_x	ΔV_y			primary	secondary		
Orbit insertion COI	1		10.6				Launch		SCS	MTVC	MIL	
First SPS burn	17	00:23:47	19.9	416	127	323	229	Preferred	109/206	SCS	MIL	Place perigee in northern hemisphere. Lower perigee altitude to be consistent with RCS deorbit capability
Second SPS burn	19	01:02:57	0.5	15	15	0	0	Preferred	112/212	GNCS	None	Minimum impulse test
Third SPS burn	32	01:23:52	57.5	1299	-29	-1176	551	Preferred	96/226	GNCS/MTVC	SCS	Set up RCS deorbit capability for touchdown in revolution 49
Fourth SPS burn	43	02:17:50	0.5	17	17	0	0	Deorbit	99/229	GNCS	CYI	Minimum impulse test
Fifth SPS burn	47	03:01:15	10.7	267	-172	0	204	Deorbit		GNCS	HAW	Deorbit burn $t_{ff} = 15$ min

TABLE VII.- ALTERNATE MISSION 3b DESCRIPTION - Continued
 (b) CSM lighting summary

ASSUMED LIFTOFF TIME = YEAR 1968		MONTH	DAY	HR	MIN	SEC	SUN-LIGHT, EARTH-SHIELD	SUN-LIGHT, EARTH-SHIELD
START IN LIGHT AT T = DAY 0	HR 0	MIN 12	SEC 11.68	START IN LIGHT AT T= DAY 0	HR 0	MIN 12	SEC 11.68	MOON-LIGHT, EARTH-SHIELD
-----SUNRISE-----								
D H M	S	LONG	D H M	S	LONG	D H M	S	LONG
0 0 39	37.66	48.02	0 1 37	17.54	-92.20	0 1 0	5.58	131.33
0 1 16	21.07	-168.24	0 2 8	35.84	25.03	0 2 29	6.83	109.53
0 2 45	23.68	169.76	0 3 37	28.25	3.36	0 3 58	19.59	88.63
0 4 14	12.25	147.08	0 5 6	27.00	-18.71	0 5 27	18.95	66.73
0 5 43	14.75	125.15	0 6 35	17.64	-41.28	0 6 45	35.74	45.67
0 7 12	4.25	102.56	0 8 4	18.64	-63.22	0 7 33	41.55	-177.51
0 8 41	4.01	80.53	0 9 33	6.16	-85.87	0 9 2	50.14	161.25
0 10 9	54.05	58.04	0 11 2	5.23	-107.89	0 10 31	53.65	139.81
0 11 38	51.14	35.07	0 12 30	53.90	-130.43	0 12 1	1.98	118.76
0 13 7	43.91	13.53				0 12 52	45.05	-40.23

TABLE VII.- ALTERNATE MISSION 3b DESCRIPTION - Continued
 (b) CSM lighting summary - Continued

D H M S	LONG	SUNSET			MOONRISE			MOONSET			REVOLUTION
		D	H	M	S	D	H	M	S	LONG	
0 14 36 35.69	-8.84	0 13 59 48.29	-152.65	0 13 30 2.10	97.12	0 14 21 49.41	-61.63	10.50	10.80	11.06	11.21
0 16 5 31.18	-31.00	0 15 28 40.96	-174.94	0 14 59 11.61	76.22	0 15 50 51.36	-83.18	11.45	11.75	12.01	12.19
0 17 34 16.95	-53.65	0 16 57 31.14	162.66	0 16 28 9.05	54.45	0 17 19 57.06	-104.44	12.68	12.94	13.07	13.33
0 19 3 16.33	-75.56	0 18 26 27.39	140.61	0 17 57 19.31	33.66	0 18 48 56.46	-126.14	13.63	13.99	14.02	14.26
0 20 32 2.88	-79.013	0 19 55 13.84	118.05	0 19 26 14.60	11.78	0 20 18 3.15	-147.29	14.62	14.95	15.21	15.49
0 22 0 58.67	-120.18	0 21 24 12.24	96.16	0 20 55 25.27	-8.92	0 21 47 28	-169.11	15.77	16.07	16.33	16.61
0 23 29 47.87	-142.58	0 22 52 56.40	73.52	0 22 24 21.73	-30.65	0 23 16 7.51	169.82	16.94	17.37	17.64	17.91
1 1 0 18.37	-164.56	1 0 23 47.92	55.28	0 23 53 9.90	-52.94	1 0 47 8.42	149.87	17.03	17.46	17.73	18.01
1 2 30 31.44	172.77	1 1 54 0.14	32.61	1 1 23 36.41	-74.47	1 2 17 32.04	128.00	18.40	18.91	19.26	19.53
1 4 0 47.65	149.78	1 3 24 17.84	10.21	1 2 53 57.43	-96.37	1 3 48 5.91	106.34	19.55	20.84	21.13	21.40
1 5 31 8.06	126.98	1 4 25 3.22	-35.05	1 5 55 9.81	-139.43	1 4 49 13.65	62.59	20.47	20.82	21.51	21.80
1 7 1 26.85	104.10	1 7 55 28.50	-57.53	1 7 25 40.10	-101.36	1 8 19 47.75	40.74	22.06	22.34	22.47	
1 8 31 51.13	81.53										

TABLE VII.- ALTERNATE MISSION 3b DESCRIPTION - Continued

(b) CSM lighting summary - Continued

SUNRISE			MOONSET			MOONRISE			MOONSET			REVOLUTION				
D	H	M	S	LONG		D	H	M	S	LONG		D	H	M	S	LONG
1	9	25	48.88	-60.24		1	8	56	18.79	177.31		1	9	50	16.97	18.54
1	10	2	16.63	59.04		1	10	56	8.17	*102.99		1	11	20	49.26	-3.40
1	11	32	39.01	36.39		1	12	26	28.35	-125.69		1	12	51	26.12	*25.04
1	13	2	59.12	13.63		1	13	56	49.65	-148.32		1	14	21	55.98	*47.14
1	14	33	17.56	*9.20		1	15	27	12.36	-170.86		1	15	52	25.21	*69.26
1	16	3	34.99	-32.08		1	16	57	36.04	166.66		1	17	22	57.71	*91.20
1	17	34	1.35	-54.46		1	18	27	53.64	143.89		1	18	53	34.80	*112.81
1	19	4	24.20	*77.01		1	19	58	11.88	121.16		1	20	24	1.47	*135.08
1	20	34	44.54	*99.69		1	21	28	30.92	98.48		1	21	54	30.86	*157.20
1	22	5	2.01	-122.46		1	22	58	50.93	75.87		1	23	25	2.79	-179.10
1	23	35	20.05	*145.30		2	0	27	21.98	51.80		2	0	55	40.26	163.64
2	1	4	.44	*170.22		2	1	32	47.09	*58.08		2	2	26	6.86	141.45
2	2	34	20.18	167.19		2	1	57	39.75	29.13		2	3	56	35.27	119.39
2	4	4	38.22	144.52												

TABLE VII.- ALTERNATE MISSION 3b DESCRIPTION - Continued
 (b) CSM Lighting summary - Continued

SUNRISE			SUNSET			MOONRISE			MOONSET			REVOLUTION
D	H	M	S	H	M	S	H	M	S	H	M	
2 5 34 54.08	121.81	2 4 58 10.63	-16.40	2 4 33 40.40	+101.90		2 5 27	6.13	97.50	35.19	35.57	34.96
2 7 5 10.37	99.07	2 6 28 26.84	+39.08	2 6 4 15.25	+123.26		2 6 57	36.91	75.62	35.0	36.13	36.45
2 8 35 24.67	76.29	2 7 58 43.76	-61.71	2 7 34 43.71	+145.01		2 8 28	1.85	53.42	36.50	37.04	36.83
2 10 5 42.81	53.72	2 9 29 1.56	-84.26	2 9 5 8.31	+166.99		2 9 58	28.29	31.32	37.39	37.94	37.06
2 11 36 1.20	31.19	2 10 59 20.49	+106.72	2 10 35 31.00	170.93		2 11 28	54.74	70.32	36.72	37.76	37.99
2 13 6 17.94	6.57	2 12 29 36.37	+129.33	2 12 6 5.78	149.64		2 12 59	27.88	+12.42	36.93	37.25	37.32
2 14 36 33.31	-14.05	2 13 59 48.90	+152.09	2 13 34 34.07	127.95		2 14 29	51.43	+34.62	39.66	39.88	40.19
2 16 6 47.53	-36.73	2 15 30 1.58	+174.62	2 15 6 58.33	106.02		2 16 0	15.57	+56.77	40.59	40.82	40.26
2 17 37 0.74	-59.43	2 17 0 14.46	162.49	2 16 37 19.92	83.95		2 17 30	41.21	+78.81	41.14	41.52	41.75
2 19 7 25.02	-82.16	2 18 30 41.06	140.36	2 18 7 43.84	62.03		2 19 1	20.35	+100.73	42.08	42.46	42.67
2 20 37 46.80	-104.77	2 20 1 4.40	117.65	2 19 38 20.81	40.23		2 20 32	1.25	+122.54	42.13	42.40	42.63
2 22 8 10.27	-127.71	2 21 31 29.79	95.08	2 21 9 6.66	18.61		2 22 2	32.67	+144.84	42.63	43.06	43.36
2 23 38 37.38	-150.22	2 23 1 58.08	72.68	2 22 39 33.28	-3.43		2 23 33	6.80	+167.00	43.77	44.08	44.32

TABLE VII.— ALTERNATE MISSION 3b DESCRIPTION - Continued
 (b) CSM lighting summary - Concluded

TABLE VII.- ALTERNATE MISSION 3b DESCRIPTION - Continued
 (c) Radar acquisition and loss summary for CSM

MSFN STATION	ACQUISITION	LOSS	ELAPSED TIME	MAX ELEVATION	MAX RANGE	MIN RANGE	REVOLUTION NUMBER
NAME	DAY HR MIN SEC	DAY HR MIN SEC	MIN SEC	MIN SEC	N MI	N MI	
BDA (S) USB-30'	0 0 12 10	0 0 13 38	1 27	6.25	622.61	2.10	
USS VANGUARD	0 0 12 10	0 0 17 17	5 6	24.90	712.43	2.15	
CYI (S) USB-30'	0 0 16 40	0 0 24 28	7 48	32.21	871.99	217.76	2.24
CRO (S) USB-30'	0 0 52 32	0 0 59 45	7 12	13.03	456.15	436.88	2.59
CNB (S) USB-85'	0 1 0 15	0 1 6 42	6 27	7.72	845.29	573.82	2.68
USS HUNTSVILLE	0 1 24 1	0 1 30 44	6 43	8.84	878.10	532.78	2.91
GDS (S) USB-85'	0 1 29 28	0 1 35 23	5 55	6.41	795.33	612.69	2.75
GYH (S) USB-30'	0 1 29 1	0 1 37 3	6 1	29.82	763.43	232.64	2.98
WHS-15 (FPPS-1.6M)	0 1 30 30	0 1 38 4	7 36	23.38	561.48	281.13	2.98
TEX (S) USB-30'	0 1 32 5	0 1 39 57	7 51	37.42	894.52	194.77	3.00
MIL (S) USB-30'	0 1 35 58	0 1 43 47	7 48	27.52	871.46	248.71	3.05
GBH (S) USB-30'	0 1 36 37	0 1 44 7	7 30	18.51	405.83	337.88	3.05
BDA (S) USB-30'	0 1 39 23	0 1 47 25	8 1	28.14	754.47	243.76	3.10
ANG-91 USB-30	0 1 43 10	0 1 46 22	3 12	1.48	904.42	836.12	3.10
USS VANGUARD	0 1 43 7	0 1 50 43	7 36	17.86	826.24	345.57	3.14
CYI (S) USB-30'	0 1 51 40	0 1 56 34	4 54	3.86	866.08	712.24	3.20
CRO (S) USB-30'	0 2 26 29	0 2 34 9	7 39	21.72	576.38	303.89	3.05
HAW (S) USB-30'	0 2 51 59	0 2 59 17	7 18	14.34	867.45	399.84	3.09
USS HUNTSVILLE	0 2 56 2	0 3 5 2	8 2	30.77	765.20	224.58	3.01
GDS (S) USB-85'	0 3 2 9	0 3 9 40	7 30	19.35	904.77	325.52	3.76
GYH (S) USB-30'	0 3 3 0	0 3 10 61	7 51	22.89	802.96	287.34	3.78
WHS-15 (FPPS-1.6M)	0 3 4 4	0 3 12 0	6 53	60.24	896.18	138.60	3.78
TEX (S) USB-30'	0 3 4 5	0 3 13 54	7 38	23.54	583.18	280.98	4.01
MIL (S) USB-30'	0 3 4 54	0 3 17 50	7 56	41.14	857.85	180.24	4.05
GBH (S) USB-30'	0 3 10 34	0 3 18 21	7 46	30.69	898.10	226.92	4.07
BDA (S) USB-30'	0 3 13 22	0 3 20 41	7 19	13.43	834.68	419.48	4.09
ANG-91 USB-30	0 3 15 40	0 3 22 29	6 48	9.24	874.45	518.93	4.11
USS VANGUARD	0 3 17 56	0 3 22 44	4 45	3.58	881.59	726.87	4.11
ACN (S) USB-30'	0 3 29 25	0 3 36 41	7 16	13.11	834.64	420.61	4.24
CRO (S) USB-30'	0 4 0 18	0 4 8 9	7 50	42.40	502.05	178.23	4.58
HAW (S) USB-30'	0 4 25 27	0 4 33 16	7 49	20.11	762.97	314.88	4.83
USS HUNTSVILLE	0 4 31 21	0 4 38 43	7 21	13.16	833.93	926.57	4.91
GDS (S) USB-85'	0 4 35 36	0 4 43 21	7 44	20.26	791.24	313.72	4.94
GYH (S) USB-30'	0 4 37 3	0 4 44 55	7 51	22.63	789.00	289.20	4.98
WHS-15 (FPPS-1.6M)	0 4 37 53	0 4 45 47	7 53	38.38	852.10	187.07	4.98
TEX (S) USB-30'	0 4 40 8	0 4 48 0	7 52	53.46	902.51	149.04	5.00
MIL (S) USB-30'	0 4 43 49	0 4 51 26	7 36	19.19	841.26	325.20	5.04
GBH (S) USB-30'	0 4 47 28	0 4 52 7	7 39	27.73	546.14	244.15	5.04
BDA (S) USB-30'	0 4 49 19	0 4 51 26	2 7	1.02	855.89	855.89	5.04
ANG-91 USB-30	0 4 49 1	0 4 56 55	7 54		778.55	245.19	5.10

TABLE VII.- ALTERNATE MISSION 3b DESCRIPTION - Continued
(c) Radar acquisition and loss summary for CSM - Continued

MSFN STATION	ACQUISITION NAME	DAY	HR	MIN	SEC	LOSS	ELAPSED TIME	MAX ELEVATION	MAX RANGE	MIN RANGE	REVOLUTION NUMBER
						DAY	HR	MIN	SEC	N MI	N MI
ACN (S) USB-30*	0	5	3	11	0	0	5	10	23	7	11
CRO (S) USB-10*	0	5	35	27	0	0	5	40	4	3	19
GWH (S) USB-30*	0	5	46	1	0	0	5	53	45	27+23	5+67
HAW (S) USB-40*	0	6	0	18	0	0	6	4	7	44	874+33
USS HUNTSVILLE	0	6	5	39	0	0	6	12	54	6	27
GDS (S) USB-35*	0	6	9	29	0	0	6	14	28	7	14
GTH (S) USB-30*	0	6	10	53	0	0	6	18	50	6	58
NHS-15 (FPFS-14H)	0	6	11	55	0	0	6	18	53	6	57
TEX (S) USB-30*	0	6	14	9	0	0	6	21	25	7	16
HIL (S) USB-30*	0	6	19	36	0	0	6	22	31	2	55
GBM (S) USB-30*	0	6	20	0	0	0	6	23	23	3	22
ANG-91 USB-30	0	6	25	22	0	0	6	27	51	2	29
USS MERCURY	0	7	18	28	0	0	7	23	17	4	49
GWH (S) USB-30*	0	7	20	18	0	0	7	27	7	6	48
HAW (S) USB-30*	0	7	34	48	0	0	7	41	1	6	12
GDS (S) USB-35*	0	7	45	11	0	0	7	47	22	2	10
USS HUNTSVILLE	0	7	39	22	0	0	7	47	19	7	57
GTH (S) USB-30*	0	7	45	29	0	0	7	51	20	5	51
USS MERCURY	0	8	50	28	0	0	8	58	16	7	48
HAW (S) USB-30*	0	9	8	25	0	0	9	15	52	7	27
USS HUNTSVILLE	0	9	13	26	0	0	9	20	34	7	10
USS MERCURY	0	10	24	29	0	0	10	32	3	7	33
HAW (S) USB-30*	0	10	42	11	0	0	10	49	50	7	38
USS REDSTONE	0	11	2	11	0	0	11	2	15	0	3
USS MERCURY	0	11	58	51	0	0	12	5	59	7	7
HAW (S) USB-30*	0	12	18	43	0	0	12	20	24	1	42
USS REDSTONE	0	12	31	8	0	0	12	38	47	7	39
ACN (S) USB-30*	0	12	57	40	0	0	13	3	44	6	4
USS MERCURY	0	13	32	43	0	0	13	40	20	7	36
GWH (S) USB-30*	0	13	39	4	0	0	13	45	22	6	17
USS REDSTONE	0	14	4	48	0	0	14	12	37	7	49
ACN (S) USB-30*	0	14	30	35	0	0	14	38	23	7	47
USS MERCURY	0	15	4	30	0	0	15	14	11	7	41
GWH (S) USB-30*	0	15	12	14	0	0	15	19	59	7	44
USS REDSTONE	0	15	39	12	0	0	15	44	24	7	11
ACN (S) USB-30*	0	16	7	57	0	0	16	8	30	0	32
USS MERCURY	0	16	41	58	0	0	16	45	33	3	35
GWH (S) USB-30*	0	16	48	13	0	0	16	50	53	0	44
USS REDSTONE	0	17	12	22	0	0	17	20	45	7	32
CYI (S) USB-30*	0	17	42	42	0	0	17	49	54	15+16	557+67
ACN (S) USB-35*	0	17	46	46	0	0	17	51	4	2	17
USS MERCURY	0	18	30	3	0	0	18	30	50	0	44
USS REDSTONE	0	18	46	51	0	0	18	54	53	0	44
ANG-91 USB-30	0	19	5	22	0	0	19	12	9	6	47
USS VANGUARD	0	19	13	7	0	0	19	14	39	1	31
CYI (S) USB-30*	0	19	16	4	0	0	19	23	54	7	52
ACN (S) USB-35*	0	19	20	2	0	0	19	26	2	5	59
CRO (S) USB-30*	0	19	52	59	0	0	19	58	22	5	22
CNB (S) USB-35*	0	20	0	36	0	0	20	7	29	6	52

TABLE VII.- ALTERNATE MISSION 3b DESCRIPTION - Continued
(c) Radar acquisition and loss summary for CSM - Continued

MSFN STATION	ACQUISITION			LOSS			ELAPSED TIME			MAX ELEVATION			MAX RANGE			MIN RANGE			REVOLUTION NUMBER
	NAME	DAY	HR	MIN	SEC	DAY	HR	MIN	SEC	MIN	SEC	DEG	N	MI	N	MI			
USS REDSTONE		0	20	21	28	0	20	27	20	5	51	6.24	799.10	616.10	14.92				
GBM (S) USB-30*		0	20	38	2	0	20	42	18	4	15	2.71	905.85	763.87	15.07				
BDA (S) USB-30*		0	20	41	11	0	20	46	3	4	51	3.59	775.44	723.95	15.09				
ANG-91 USB-30		0	20	38	34	0	20	46	13	7	38	27.52	566.27	243.72	15.09				
USS VANGUARD		0	20	43	23	0	20	50	34	7	11	12.69	654.83	430.85	15.16				
CYI (S) USB-30*		0	20	50	7	0	20	57	45	7	37	23.06	893.95	281.61	15.23				
HAD (S) USB-85*		0	20	53	8	0	20	59	23	6	15	7.62	733.95	558.44	15.26				
CRO (S) USB-30*		0	21	25	9	0	21	33	8	7	59	26.57	739.61	251.69	15.40				
CNB (S) USB-85*		0	21	33	37	0	21	41	19	7	42	19.02	800.85	329.62	15.70				
TEX (S) USB-30*		0	22	7	22	0	22	12	8	4	46	3.49	796.03	726.28	16.00				
HIL (S) USB-30*		0	22	9	35	0	22	16	55	7	20	15.12	788.12	382.93	16.06				
GBM (S) USB-30*		0	22	9	42	0	22	17	29	7	47	24.74	807.92	265.69	16.06				
ANG-91 USB-30		0	22	13	53	0	22	19	4	5	11	4.17	871.29	697.14	16.09				
BDA (S) USB-30*		0	22	16	55	0	22	20	45	7	50	18.74	819.74	329.45	16.11				
USS VANGUARD		0	22	16	55	0	22	21	24	26	7	50	43.41	878.34	171.01	16.16			
CYI (S) USB-30*		0	22	23	58	0	22	31	47	7	48	34.62	865.21	202.75	16.23				
HAD (S) USB-95*		0	22	27	23	0	22	31	25	4	2	2.22	811.64	786.14	16.23				
CRO (S) USB-30*		0	22	59	13	0	22	59	13	0	23	4.80	824.83	376.00	16.60				
CNB (S) USB-85*		0	23	7	10	0	23	14	43	7	32	16.76	829.16	361.00	16.70				
GYM (S) USB-30*		0	23	37	3	0	23	43	41	6	38	10.01	907.22	492.70	16.96				
WHS-15 (RFPS-16H)		0	23	38	57	0	23	44	37	5	40	5.84	901.32	624.15	16.97				
TEX (S) USB-30*		0	23	39	14	0	23	46	58	7	43	35.36	915.26	199.03	17.00				
HIL (S) USB-30*		0	23	43	0	0	23	45	14	7	58	63.04	901.26	133.55	17.05				
GBM (S) USB-30*		0	23	43	32	0	23	51	16	7	32	16.76	829.16	361.00	16.70				
ANG-91 USB-30		0	23	50	29	0	23	51	59	1	29	.65	916.53	916.53	17.08				
BDA (S) USB-30*		0	23	46	42	0	23	54	53	8	10	35.00	911.22	219.62	17.10				
USS VANGUARD		0	23	50	6	0	23	58	6	8	38	29.23	734.06	264.22	17.15				
CYI (S) USB-30*		0	23	57	21	0	24	0	4	30	9	8	35.74	877.12	266.12	17.23			
CRO (S) USB-30*		0	23	58	0	0	24	55	9	5	16.97	882.60	497.77	17.40					
CNB (S) USB-85*		0	24	58	0	0	49	28	7	29	10.04	968.71	406.32	17.68					
USS HUNTSVILLE		-1	1	6	28	-1	1	13	6	3	37	11.24	710.79	423.94	17.89				
GDS (S) USB-85*		-1	1	51	1	-1	1	19	53	6	1	7.05	819.29	567.20	17.94				
GYM (S) USB-30*		-1	1	37	1	-1	1	19	20	7	43	77.72	928.40	117.72	17.99				
WHS-15 (RFPS-16H)		-1	1	33	50	-1	1	20	38	7	37	22.80	822.86	261.63	17.99				
TEX (S) USB-30*		-1	1	44	33	-1	1	22	28	7	55	20.93	747.43	313.79	18.01				
HIL (S) USB-30*		-1	1	48	18	-1	1	24	31	8	14	20.83	766.87	327.52	18.04				
GBM (S) USB-30*		-1	1	49	19	-1	1	24	57	7	54	18.26	882.88	375.50	18.24				
BDA (S) USB-30*		-1	1	51	21	-1	1	19	63	8	43	45.78	895.43	193.53	18.31				
ANG-91 USB-30		-1	1	52	44	-1	1	24	56	5	10	3.58	962.75	826.37	18.41				
USS VANGUARD		-1	1	55	16	-1	1	33	51	6	35	24.48	991.13	340.61	18.45				
CYI (S) USB-30*		-1	1	53	21	-1	1	40	15	6	54	6.28	1003.03	801.38	18.50				
ACN (S) USB-30*		-1	1	40	15	-1	1	44	8	3	53	1.45	1097.44	1049.92	18.54				
CRO (S) USB-30*		-1	1	36	1	-1	1	30	19	2	2	23.28	761.21	374.15	18.60				
HAW (S) USB-30*		-1	1	35	50	-1	2	42	58	7	6	20.06	565.49	261.41	18.63				
USS HUNTSVILLE		-1	1	41	7	-1	2	48	39	7	32	31.60	850.07	209.84	18.70				
GYM (S) USB-85*		-1	1	45	46	-1	2	53	30	7	44	23.34	964.67	285.64	18.75				
GYM (S) USB-30*		-1	1	46	54	-1	2	54	44	7	49	24.96	978.70	277.54	18.77				
WHS-15 (RFPS-16H)		-1	1	47	50	-1	2	55	58	8	7	79.46	981.16	131.33	18.80				
TEX (S) USB-30*		-1	1	49	54	-1	2	58	5	8	8	25.65	926.19	291.98	19.02				

TABLE VII.- ALTERNATE MISSION 3b DESCRIPTION - Continued
(c) Radar acquisition and loss summary for CSM - Continued

MSFN STATION	ACQUISITION	LOSS			ELAPSED TIME			MAX ELEVATION			MAX RANGE			MIN RANGE			REVOLUTION NUMBER
		DAY	HR	MIN	SEC	DAY	HR	MIN	SEC	MIN	SEC	DEG	N MI	N MI	N MI		
MIL (S) USB-30*	1 2 53 28	1	3	2	15	8	46	60.95	972.99	168.14	19.07	273.34	964.33	273.34	19.07	70	
GBM (S) USB-30*	1 2 54 9	1	3	2	56	8	47	30.86	964.33	462.77	19.09	997.81	16.07	462.77	19.09		
BDA (S) USB-30*	1 2 56 49	1	3	5	14	8	25	16.07	997.81	896.45	19.11	467.68	17.38	896.45	19.11		
ANG-91 USB-30	1 2 58 49	1	3	7	30	8	40	10.02	788.05	1119.27	19.12	10.02	809.73	1119.27	19.12		
USS VANGUARD	1 3 1 6	1	3	7	36	6	30	5.40	857.09	1011.75	19.25	10.02	330.25	1011.75	19.25		
ACN (S) USB-30*	1 3 12 18	1	3	22	36	10	18	35.82	22.28	777.86	333.23	22.28	35.82	980.28	22.28		
GDS (S) USB-85*	1 3 14 20	1	3	29	3	8	19	27.15	795.65	287.14	19.94	248.40	35.95	287.14	19.94		
GYN (S) USB-30*	1 4 22 1	1	4	30	49	8	37	39.56	838.01	842.22	19.64	842.22	842.22	842.22	19.64		
WHS-15 (IFPS-16H)	1 4 22 55	1	4	31	33	8	37	15.33	788.05	36.75	19.83	36.75	15.33	788.05	36.75		
TEX (S) USB-30*	1 4 25 4	1	4	18	27	7	21	12.04	857.09	457.34	19.91	12.04	12.04	857.09	19.91		
HAN (S) USB-30*	1 4 28 40	1	4	24	12	7	23	22.02	955.93	393.16	20.04	22.02	22.02	955.93	393.16		
USS HUNTSVILLE	1 4 49 4	1	4	29	36	9	4	28.58	997.40	323.38	20.04	28.58	28.58	997.40	323.38		
GDS (S) USB-30*	1 4 50 43	1	4	22	22	4	49	1063.58	1063.58	1063.58	20.04	1063.58	1063.58	1063.58	20.04		
GBM (S) USB-30*	1 4 53 26	1	4	33	49	4	30	2.82	764.66	345.69	20.09	764.66	2.82	764.66	345.69		
ANG-91 USB-30	1 4 53 49	1	4	48	3	4	57	28.65	1180.04	166.03	20.02	1180.04	166.03	1180.04	166.03		
ACN (S) USB-30*	1 4 55 3	1	4	22	31	5	26	66.52	988.82	218.92	20.04	988.82	66.52	988.82	218.92		
CRO (S) USB-30*	1 5 22 31	1	5	32	55	5	40	1.78	885.86	869.05	20.54	885.86	1.78	885.86	869.05		
GWH (S) USB-30*	1 5 29 22	1	5	40	33	7	37	24.38	767.00	233.96	20.64	24.38	24.38	767.00	233.96		
GBM (S) USB-30*	1 5 32 23	1	5	47	23	5	42	28.82	939.94	612.94	20.64	939.94	28.82	939.94	612.94		
HAN (S) USB-30*	1 5 52 19	1	5	52	19	6	0	15.67	890.64	426.17	20.91	890.64	15.67	890.64	426.17		
GDS (S) USB-85*	1 5 55 59	1	5	55	59	6	57	1005.40	488.45	20.95	1005.40	1005.40	488.45	20.95			
GYN (S) USB-30*	1 5 57 27	1	5	57	27	6	31	14.16	1130.16	947.24	21.03	1130.16	14.16	1130.16	947.24		
WHS-15 (IFPS-16H)	1 5 58 20	1	5	58	20	6	31	44.91	927.56	529.79	20.97	927.56	44.91	927.56	529.79		
TEX (S) USB-30*	1 5 58 23	1	5	53	42	6	19	15.59	840.68	510.11	20.99	840.68	15.59	840.68	510.11		
MIL (S) USB-30*	1 5 59 19	1	5	52	19	6	0	15.67	1068.49	951.08	21.01	1068.49	15.67	1068.49	951.08		
GDS (S) USB-30*	1 6 55 9	1	6	55	9	5	57	7	58	1095.71	985.01	21.06	1095.71	7	58	985.01	
GYN (S) USB-30*	1 6 57 27	1	6	57	27	6	31	3.35	985.01	970.13	21.06	985.01	3.35	985.01	970.13		
ANG-91 USB-30	1 6 58 20	1	6	58	20	6	31	1.309	1159.83	1124.13	21.19	1159.83	1.309	1159.83	1124.13		
ACN (S) USB-30*	1 6 58 26	1	6	56	26	6	30	1.49	803.61	596.03	21.63	803.61	1.49	803.61	596.03		
USS MERCURY	1 7 0 28	1	7	0	28	6	4	15.59	5.77	838.17	21.65	5.77	15.59	838.17	21.65		
GWH (S) USB-30*	1 7 0 30	1	7	0	30	5	10	3.01	1068.49	951.08	21.01	1068.49	3.01	1068.49	951.08		
GBM (S) USB-30*	1 7 0 46	1	7	0	46	5	11	4.91	3.01	1130.16	21.03	3.01	4.91	1130.16	21.03		
ANG-91 USB-30	1 7 1 1	1	7	1	1	6	14	3.45	1130.16	947.24	21.03	1130.16	3.45	1130.16	947.24		
ACN (S) USB-30*	1 7 1 26	1	7	26	29	6	16	3.35	1095.71	985.01	21.06	1095.71	3.35	1095.71	985.01		
USS HUNTSVILLE	1 7 27 29	1	7	36	35	7	36	6.18	987.10	176.28	21.91	987.10	6.18	987.10	176.28		
WHS-15 (IFPS-16H)	1 7 34 24	1	7	12	2	5	32	5.77	803.61	1071.68	21.92	803.61	5.77	803.61	1071.68		
GYN (S) USB-30*	1 7 33 23	1	7	15	1	7	40	5.77	1094.67	742.92	21.94	742.92	5.77	1094.67	742.92		
TEX (S) USB-30*	1 7 38 54	1	7	40	34	7	4	0.59	938.75	602.20	21.94	938.75	0.59	938.75	602.20		
USS MERCURY	1 7 40 30	1	7	32	39	7	37	2.12	974.27	970.13	21.91	974.27	2.12	974.27	970.13		
GDS (S) USB-85*	1 7 40 30	1	7	32	39	7	37	2.12	974.27	970.13	21.91	974.27	2.12	974.27	970.13		
USS HUNTSVILLE	1 7 41 54	1	7	27	29	7	36	2.12	61.86	176.28	21.91	61.86	2.12	176.28	21.91		
WHS-15 (IFPS-16H)	1 7 41 54	1	7	12	2	5	32	5.77	1071.68	529.96	22.08	1071.68	5.77	1071.68	529.96		
GWH (S) USB-30*	1 7 41 54	1	7	15	1	7	40	5.77	1094.67	371.07	22.42	371.07	5.77	1094.67	371.07		
TEX (S) USB-30*	1 7 41 54	1	7	40	34	7	40	0.59	1094.50	1094.50	22.03	1094.50	0.59	1094.50	1094.50		
USS MERCURY	1 7 41 54	1	7	40	30	7	48	1.44	30.41	775.52	22.63	30.41	1.44	775.52	22.63		
GYN (S) USB-30*	1 7 41 54	1	7	40	36	7	48	1.44	843.15	1170.57	23.97	843.15	1.44	843.15	1170.57		
ACN (S) USB-30*	1 7 41 54	1	7	40	36	7	48	2.68	61.86	647.82	24.62	61.86	2.68	647.82	24.62		
USS HUNTSVILLE	1 7 41 54	1	7	40	36	7	48	2.68	15.05	947.50	22.08	15.05	2.68	947.50	22.08		
USS MERCURY	1 7 41 54	1	7	40	36	7	48	2.68	15.05	635.92	21.94	15.05	2.68	635.92	21.94		
GWH (S) USB-30*	1 7 41 54	1	7	40	36	7	48	2.68	994.24	340.02	23.83	340.02	2.68	994.24	340.02		
TEX (S) USB-30*	1 7 41 54	1	7	40	36	7	48	2.68	1170.57	775.95	23.97	775.95	2.68	1170.57	775.95		
USS REDSTONE	1 7 41 54	1	7	40	36	7	48	2.68	14.31	437.68	24.62	14.31	2.68	437.68	24.62		
USS MERCURY	1 7 41 54	1	7	40	36	7	48	2.68	1.57	989.70	24.78	1.57	2.68	989.70	24.78		
GWH (S) USB-30*	1 7 41 54	1	7	40	36	7	48	2.68	1.57	1067.40	24.78	1.57	2.68	1067.40	24.78		
TEX (S) USB-30*	1 7 41 54	1	7	40	36	7	48	2.68	1.57	1073.01	24.78	1.57	2.68	1073.01	24.78		
USS REDSTONE	1 7 41 54	1	7	40	36	7	48	2.68	1.57	1081.37	24.78	1.57	2.68	1081.37	24.78		

TABLE VII.- ALTERNATE MISSION 3b DESCRIPTION - Continued
(c) Radar acquisition and loss summary for CSM - Continued

MSFN STATION	ACQUISITION NAME	DAY	HR	MIN	SEC	LOSS	ELAPSED TIME	MAX ELEVATION	MAX RANGE	MIN RANGE	REVOLUTION NUMBER		
		DAY	HR	MIN	SEC	DAY	HR	MIN	N MI	N MI			
ACN (S) USB-30*	12 51 29	1	12	59	9	7	39	14.21	1020.52	453.13	25.23		
USS MERCURY	13 27 1	1	13	27	1	1	13	45	34.78	1039.65	25.64		
GWH (S) USB-30*	13 32 47	1	13	32	47	1	13	41	17.36	900.14	473.49	25.68	
USS REDSTONE	13 59 21	1	13	59	21	1	14	9	26.20	1175.53	420.20	25.95	
ACN (S) USB-30*	14 26 49	1	14	26	49	1	14	34	15.32	829.94	387.25	26.22	
USS MERCURY	15 2 13	1	15	2	13	1	15	11	9	20.36	412.55	26.61	
GWH (S) USB-30*	15 7 47	1	15	7	47	1	15	17	25.60	781.32	380.32	26.66	
USS REDSTONE	15 35 15	1	15	35	15	1	15	45	18.23	844.47	515.12	26.96	
CYI (S) USB-30*	16 9 9	1	16	9	9	1	16	12	.89	832.84	623.27	27.23	
USS MERCURY	16 39 26	1	16	39	26	1	16	44	2.38	1089.23	990.64	27.58	
GWH (S) USB-30*	16 45 47	1	16	45	47	1	16	49	1.76	149.22	1072.33	27.63	
USS REDSTONE	17 11 25	1	17	11	25	1	17	20	26.89	131.49	361.93	27.94	
CYI (S) USB-30*	17 53 41	1	17	53	41	1	17	49	26.38	536.12	235.42	28.23	
HAD (S) USB-85*	17 58 58	1	17	58	58	1	17	51	2.66	908.39	752.75	28.26	
CRO (S) USB-30*	18 21 11	1	18	21	11	1	18	22	.39	1170.96	1170.96	28.58	
CNB (S) USB-85*	18 26 37	1	18	26	37	1	18	34	9.25	1057.67	778.43	28.75	
USS REDSTONE	18 47 2	1	18	47	2	1	18	56	39.09	1003.57	242.56	29.95	
ANG-91 USB-30	19 5 54	1	19	5	54	1	19	13	7	23.67	553.43	256.98	29.10
USS VANGUARD	19 12 15	1	19	12	15	1	19	16	2.80	745.95	723.12	29.14	
CYI (S) USB-30*	19 17 2	1	19	17	2	1	19	24	23.92	271.01	272.24		
HAD (S) USB-85*	19 20 32	1	19	20	32	1	19	27	8.71	730.65	541.17	29.26	
CRO (S) USB-30*	19 52 14	1	19	52	14	1	20	2	20.60	1115.07	503.93	29.62	
CNB (S) USB-85*	20 0 45	1	20	0	45	1	20	10	26.73	1057.37	410.94	29.71	
USS REDSTONE	20 15 24	1	20	15	24	1	20	28	2.59	971.65	840.24	29.70	
HIL (S) USB-30*	20 40 10	1	20	40	10	1	20	44	2.60	783.88	733.63	30.05	
GWH (S) USB-30*	20 39 34	1	20	39	34	1	20	45	5.82	612.64	594.44		
BDA (S) USB-30*	20 42 53	1	20	42	53	1	20	48	7.42	761.55	539.64	30.10	
ANG-91 USB-30	20 41 35	1	20	41	35	1	20	48	11.08	749.04	437.89	30.10	
USS VANGUARD	20 45 42	1	20	45	42	1	20	53	7.24	22.07	604.65	279.62	30.15
CYI (S) USB-30*	22 0 52	1	22	0	52	1	21	0	2.60	19.70	612.83	334.16	30.24
HAD (S) USB-85*	22 17 55	1	22	17	55	1	21	1	5.46	7.18	938.88	621.99	30.27
CRO (S) USB-30*	22 12 12	1	22	12	12	1	21	37	39.42	1162.12	314.50	30.62	
CNB (S) USB-85*	22 17 4	1	22	17	4	1	22	45	10.0	36.46	1054.16	308.85	30.71
TEX (S) USB-30*	22 10 30	1	22	10	30	1	22	42	4.1	8.40	698.98	506.87	31.01
HIL (S) USB-30*	22 13 31	1	22	13	31	1	22	58	7.26	28.22	667.83	224.90	31.05
GWH (S) USB-30*	22 14 44	1	22	14	44	1	22	21	7.37	79.07	503.64	113.42	31.05
ANG-91 USB-30	22 19 10	1	22	19	10	1	22	22	1.0	1.0	1.0		
BOA (S) USB-30*	22 17 4	1	22	17	4	1	22	24	7.42	25.51	792.46	254.73	31.10
USS VANGUARD	22 20 31	1	22	20	31	1	22	28	8.7	28.07	748.40	243.52	31.15
HAD (S) USB-85*	22 31 7	1	22	31	7	1	22	35	4.25	2.50	943.59	680.74	31.22
CYI (S) USB-30*	22 41 17	1	22	41	17	1	23	46	4.1	59.76	867.83	163.64	31.24
CRO (S) USB-30*	22 3 15	1	22	3	15	1	23	13	7	21.57	1154.74	475.68	31.60
CNB (S) USB-85*	22 1 31	1	22	1	31	1	23	20	4.6	21.17	1161.51	438.66	31.69
USS HUNTSVILLE	23 38 54	1	23	38	54	1	23	41	5.2	1.38	650.01	801.64	31.88
GDS (S) USB-85*	23 44 17	1	23	44	17	1	23	46	2.2	.79	872.27	828.19	31.93
GWH (S) USB-30*	23 42 21	1	23	42	21	1	23	49	7.1	18.82	686.26	305.09	31.94
BHS-15 (FPPS-14M)	23 44 0	1	23	44	0	1	23	50	6.6	10.67	447.67	31.97	
TEX (S) USB-30*	23 44 57	1	23	44	57	1	23	52	7	85.66	908.42	112.59	32.00
HIL (S) USB-30*	23 43 56	1	23	43	56	1	23	56	7	36.14	874.27	32.06	

TABLE VII.- ALTERNATE MISSION 3b DESCRIPTION - Continued

(c) Radar acquisition and loss summary for CSM - Continued

MSFN STATION	ACQUISITION			LOSS			ELAPSED TIME			MAX ELEVATION			MAX RANGE			MIN RANGE			REVOLUTION NUMBER			
	NAME	DAY	HR	MIN	SEC	DAY	HR	MIN	SEC	MIN	SEC	DEG	N MI	N MI	N MI	N MI	N MI	N MI	N MI	N MI		
GBH (S) USB-30*	1	23	49	20		1	23	56	26	7	5	20+11	884.98	309.87	32.006							
BDA (S) USB-30*	1	23	52	13		1	23	59	34	7	21	39+32	907.14	171.55	32.011							
USS VANGUARD	1	23	55	51		2	0	3	10	7	18	58+01	522.97	118.64	32.014							
CYI (S) USB-30*	2	0	3	33		2	0	10	7	6	33	14+39	700+49	323.51	32.022							
CRO (S) USB-30*	2	0	37	58		2	0	48	3	10	5	20+09	1152.98	530+23	32.022							
CNB (S) USB-30*	2	0	45	32		2	0	55	1	9	29	13+70	979+64	683+54	32.022							
HAW (S) USB-30*	2	1	6	21		2	1	12	48	6	27	5+55	984+62	826+58	32.023							
USS HUNTSVILLE	2	1	10	33		2	1	19	15	8	41	27+46	909+87	303+48	32.023							
GDS (S) USB-85*	2	1	16	17		2	1	23	36	7	19	12+02	887+68	483+44	32.023							
GYN (S) USB-30*	2	1	16	37		2	1	24	52	8	15	38+16	831+97	198+06	32.023							
TEX (S) USB-30*	2	1	19	58		2	1	27	27	7	29	20+71	648+17	303+39	33.000							
WHS-15 (FPS-16H)	2	1	17	57		2	1	25	56	7	58	30+32	792+71	236+25	33.000							
MIL (S) USB-30*	2	1	24	2		2	1	31	12	7	10	20+18	608+49	278+24	33.005							
GBH (S) USB-30*	2	1	24	52		2	1	31	32	4	40	11+09	819+69	425+31	33.007							
BDA (S) USB-30*	2	1	27	34		2	1	34	43	7	8	40+53	561+01	148+29	33.009							
ANG-91 USB-30	2	1	32	52		2	1	33	33	0	41	0+12	808+59	808+59	33.009							
USS VANGUARD	2	1	31	29		2	2	24	11	4	12	9+76	827+18	415+42	33.014							
CRO (S) USB-30*	2	2	13	23		2	2	24	14	10	51	36+97	1216+96	355+96	33.014							
CNB (S) USB-85*	2	2	23	25		2	2	26	13	2	47	1247+11	1247+11	1201+93	33.014							
HAW (S) USB-30*	2	2	40	5		2	2	49	7	9	1	38+38	613+49	235+30	33.015							
USS HUNTSVILLE	2	2	46	7		2	2	54	15	8	8	20+07	760+07	349+03	33.016							
GDS (S) USB-85*	2	2	51	14		2	2	58	58	7	33	27+34	895+60	232+23	33.016							
GYN (S) USB-30*	2	2	52	34		2	2	59	47	7	12	14+91	790+44	369+73	33.016							
WHS-15 (FPS-16H)	2	2	53	31		2	2	53	1	0	7	28	72+96	512+95	111+46	33.016						
TEX (S) USB-30*	2	2	55	50		2	2	54	19	6	59	18+28	564+15	291+99	34.000							
MIL (S) USB-30*	2	2	59	33		2	3	6	39	7	5	42+27	574+82	140+34	34.005							
GBH (S) USB-30*	2	3	0	11		2	3	7	14	7	3	32+57	569+99	172+59	34.005							
BDA (S) USB-30*	2	3	3	14		2	3	8	57	5	42	7+31	776+21	483+89	34.007							
ANG-91 USB-30	2	3	5	11		2	3	11	29	6	18	10+53	823+47	396+18	34.011							
ACN (S) USB-30*	2	3	18	6		2	3	26	21	8	14	38+35	839+53	196+76	34.014							
CRO (S) USB-30*	2	3	48	47		2	3	59	6	10	39	31+44	1121+10	395+08	34.015							
GHN (S) USB-30*	2	4	31	12		2	4	35	10	9	4	9+06	1034+78	726+08	34.016							
HAW (S) USB-30*	2	4	16	9		2	4	38	14	7	39	13+96	856+57	450+32	34.016							
USS HUNTSVILLE	2	4	22	30		2	4	49	4	6	35	9+71	755+78	485+11	34.017							
GDS (S) USB-85*	2	4	35	44		2	4	57	41	6	58	16+91	677+97	285+12	34.017							
GYN (S) USB-30*	2	4	26	29		2	4	33	28	6	58	26+17	585+13	213+04	34.018							
WHS-15 (FPS-16H)	2	4	28	8		2	4	35	13	7	5	17+36	735+18	291+55	34.018							
TEX (S) USB-30*	2	4	31	12		2	4	38	14	7	1	26+22	779+56	203+13	35+01							
MIL (S) USB-30*	2	4	35	7		2	4	41	7	4	0	8+95	745+98	434+92	35+03							
GBH (S) USB-30*	2	4	35	44		2	4	57	6	13	13	10+28	737+44	404+13	35+04							
ANG-91 USB-30	2	4	40	12		2	4	46	52	6	39	14+00	601+53	346+76	35+04							
ACN (S) USB-30*	2	4	45	7		2	4	51	2	4	54	7+90	831+31	657+35	35+04							
CRO (S) USB-30*	2	5	25	6		2	5	32	18	6	22	4+38	1104+27	99+54	35+05							
GHN (S) USB-30*	2	5	36	58		2	5	46	30	9	31	49+06	1054+04	434+92	35+05							
HAW (S) USB-30*	2	5	53	6		2	5	58	27	5	21	4+89	864+65	648+20	35+06							
USS HUNTSVILLE	2	5	58	15		2	6	4	45	6	29	11+81	635+04	367+27	35+06							
GDS (S) USB-85*	2	6	2	13		2	6	7	36	5	23	6+04	787+21	524+80	35+06							
GYN (S) USB-30*	2	6	34	4		2	6	10	18	6	43	18+56	654+85	266+30	35+06							
WHS-15 (FPS-16H)	2	6	49	2		2	6	9	46	2	6	5+11	757+25	555+70	35+06							

TABLE VII.- ALTERNATE MISSION 3b DESCRIPTION - Continued
 (c) Radar acquisition and loss summary for CSM - Continued

MSFN STATION	ACQUISITION			LOSS			ELAPSED TIME			MAX ELEVATION			MAX RANGE			MIN RANGE			REVOLUTION NUMBER		
	NAME	DAY	HR	MIN	SEC	DAY	HR	MIN	SEC	MIN	SEC	DEG	N	MI	N	MI	N	MI	NUMBER		
TEX (SI) USB-30*	2	7	1			2	6	12	21	5	19	6.09	733	.03	524	.23	35	.98			
USS MERCURY	2	7	9	58		2	7	18	23	6	24	14.44	841	.73	516	.67	36	.63			
GWH (SI) USB-30*	2	7	14	7		2	7	20	21	6	14	5.86	861	.11	722	.73	36	.66			
HAW (SI) USB-30*	2	7	29	0		2	7	34	19	5	19	5.58	774	.45	563	.36	36	.83			
USS HUNTSVILLE	2	7	33	29		2	7	40	26	6	57	3.23	821	.96	166	.15	36	.89			
GYH (SI) USB-30*	2	7	41	22		2	7	41	41	0	19	.15	807	.11	807	.11	36	.91			
USS MERCURY	2	8	45	3		2	8	53	30	8	27	49.56	968	.45	181	.22	37	.44			
HAW (SI) USB-30*	2	8	47			2	9	10	39	4	52	24.64	576	.00	210	.87	37	.63			
USS HUNTSVILLE	2	9	9	28		2	9	14	14	4	46	4.29	807	.34	596	.80	37	.87			
USS MERCURY	2	10	21	20		2	10	28	22	7	2	11.67	939	.54	449	.08	38	.62			
HAW (SI) USB-30*	2	10	39	20		2	10	45	15	5	55	8.00	777	.92	462	.64	38	.80			
USS REDSTONE	2	10	54	26		2	11	1	25	6	58	791	.14	615	.25	38	.75				
ACN (SI) USB-30*	2	11	20	37		2	11	27	12	6	35	4.41	1141	.47	1012	.78	37	.24			
USS MERCURY	2	11	57	22		2	12	3	39	6	16	8.28	866	.83	482	.73	39	.63			
USS REDSTONE	2	12	28	13		2	12	37	39	9	26	40.69	1119	.51	252	.73	39	.97			
ACN (SI) USB-30*	2	12	54	32		2	13	4	50	10	29	30.90	1027	.94	386	.78	40	.24			
USS MERCURY	2	13	32	28		2	13	39	24	6	56	24.91	630	.83	214	.28	40	.61			
GWH (SI) USB-30*	2	13	36	24		2	13	44	54	4	29	13.71	604	.70	333	.82	40	.67			
USS REDSTONE	2	14	3	41		2	14	13	14	9	32	21.14	860	.86	447	.68	40	.76			
ACN (SI) USB-30*	2	14	30	1		2	14	39	35	9	33	16.72	1124	.40	516	.90	41	.23			
USS MERCURY	2	15	8	0		2	15	14	3	6	3	9.52	716	.23	419	.78	41	.61			
GWH (SI) USB-30*	2	15	13	37		2	15	19	55	6	18	9.19	794	.64	461	.23	41	.66			
USS REDSTONE	2	15	39	20		2	15	49	9	9	48	19.31	1138	.69	520	.24	41	.96			
CYI (SI) USB-30*	2	16	11	13		2	16	18	35	7	21	8.58	1077	.13	672	.47	42	.24			
USS REDSTONE	2	17	14	32		2	17	25	16	10	43	38.02	1028	.84	330	.85	42	.96			
ANG-91 USB-30	2	17	35	10		2	17	42	2	5	51	5.85	1143	.70	958	.20	43	.11			
CYI (SI) USB-30*	2	17	45	33		2	17	54	7	6	34	56.56	1064	.56	171	.58	43	.25			
HAD (SI) USB-85*	2	17	50	15		2	17	56	15	5	59	5.74	879	.23	664	.47	43	.28			
CNB (SI) USB-85*	2	18	30	28		2	18	38	29	8	0	10.74	1087	.79	640	.1	43	.72			
USS REDSTONE	2	18	50	0		2	19	0	49	10	48	35.58	1082	.04	364	.40	43	.95			
GBH (SI) USB-30*	2	19	11	23		2	19	12	25	1	1	.36	1104	.97	1104	.97	44	.05			
BDA (SI) USB-30*	2	19	13	30		2	19	17	8	3	37	1.54	1050	.38	983	.45	44	.09			
ANG-91 USB-30	2	19	9	0		2	19	18	36	9	35	42.42	941	.49	192	.52	44	.11			
USS VANGUARD	2	19	14	58		2	19	22	24	7	25	9.32	913	.32	625	.17	44	.16			
CYI (SI) USB-30*	2	19	21	23		2	19	29	17	7	54	21.11	871	.09	268	.04	44	.24			
HAD (SI) USB-85*	2	19	24	49		2	19	31	21	6	31	9.50	730	.93	496	.88	44	.26			
CRO (SI) USB-30*	2	19	56	36		2	20	5	24	6	48	20.89	842	.77	383	.39	44	.60			
CNB (SI) USB-85*	2	20	4	31		2	20	14	31	9	59	29.21	1127	.63	375	.02	44	.72			
USS REDSTONE	2	20	27	0		2	20	34	1	7	0	5.26	1214	.66	970	.57	44	.92			
TEX (SI) USB-30*	2	20	41	19		2	20	44	44	3	25	1.08	1073	.13	1042	.46	45	.01			
MIL (SI) USB-30*	2	20	42	37		2	20	50	23	7	46	10.37	950	.68	623	.80	45	.07			
GBH (SI) USB-30*	2	20	42	30		2	20	51	4	8	33	15.24	831	.89	489	.99	45	.07			
ANG-91 USB-30	2	20	45	31		2	20	53	13	7	41	11.30	999	.70	548	.32	45	.09			
BDA (SI) USB-30*	2	20	46	15		2	20	54	13	7	58	15.76	919	.78	448	.98	45	.12			
USS VANGUARD	2	20	49	42		2	20	57	52	8	10	3.21	964	.63	203	.29	45	.14			
CYI (SI) USB-30*	2	20	57	23		2	21	4	34	7	10	14.41	796	.58	359	.22	45	.24			
HAD (SI) USB-85*	2	21	0	18		2	21	5	34	5	16	4.46	634	.00	621	.35	45	.24			
CRO (SI) USB-30*	2	21	31	32		2	21	41	16	9	44	40.01	973	.46	270	.61	45	.61			
CNB (SI) USB-85*	2	21	31	31		2	21	41	16	9	31	39.79	1246	.94	314	.61	45	.72			

TABLE VII.- ALTERNATE MISSION 3b DESCRIPTION - Concluded
 (c) Radar acquisition and loss summary for CSM - Concluded

MSFN STATION NAME	ACQUISITION DAY HR MIN SEC			LOSS DAY HR MIN SEC			ELAPSED TIME MIN SEC			MAX ELEVATION DEG			MAX RANGE N MI			MIN RANGE N MI			REVOLUTION NUMBER																							
	2	22	11	52	2	22	18	44	6	52	6•46	1116•43	761•23	45•98	886•43	895•56	895•56	45•98	46•02	400•97	1065•01	20•22	3•41	46•05	152•89	926•96	67•39	46•05	1017•13	106•63	48•73	46•07	893•45	893•45	46•07							
GYM (S) USB-30*	2	22	14	2	2	22	19	29	5	26	3•41	895•56	886•43	45•98	895•56	886•43	886•43	45•98	46•02	400•97	1065•01	20•22	3•41	46•05	152•89	926•96	67•39	46•05	1017•13	106•63	48•73	46•07	893•45	893•45	46•07							
WHS-15 (FPS=1.6H)	2	22	13	44	2	22	22	15	8	30	6•46	1116•43	761•23	45•98	895•56	886•43	886•43	45•98	46•02	400•97	1065•01	20•22	3•41	46•05	152•89	926•96	67•39	46•05	1017•13	106•63	48•73	46•07	893•45	893•45	46•07							
TEX (S) USB-30*	2	22	17	19	2	22	25	56	8	37	6•46	1116•43	761•23	45•98	895•56	886•43	886•43	45•98	46•02	400•97	1065•01	20•22	3•41	46•05	152•89	926•96	67•39	46•05	1017•13	106•63	48•73	46•07	893•45	893•45	46•07							
MIL (S) USB-30*	2	22	17	47	2	22	26	18	8	31	6•46	1116•43	761•23	45•98	895•56	886•43	886•43	45•98	46•02	400•97	1065•01	20•22	3•41	46•05	152•89	926•96	67•39	46•05	1017•13	106•63	48•73	46•07	893•45	893•45	46•07							
CRO (S) USB-30*	2	22	21	10	2	22	26	34	2	23	6•46	1116•43	761•23	45•98	895•56	886•43	886•43	45•98	46•02	400•97	1065•01	20•22	3•41	46•05	152•89	926•96	67•39	46•05	1017•13	106•63	48•73	46•07	893•45	893•45	46•07							
ANG-91 USB-30	2	22	21	20	2	22	29	33	8	13	50•01	871•77	162•61	46•10	871•77	162•61	162•61	46•10	46•15	203•01	203•01	20•22	32•42	785•58	617•11	16•07	46•22	500•23	500•23	46•61	46•61	439•77	439•77	46•70								
BDA (S) USB-30*	2	22	25	11	2	22	33	2	7	51	50•01	871•77	162•61	46•10	871•77	162•61	162•61	46•10	46•15	203•01	203•01	20•22	35•56	617•11	617•11	16•07	46•22	500•23	500•23	46•61	46•61	439•77	439•77	46•70								
USS VANGUARD	2	22	32	50	2	22	39	59	7	9	50•01	1037•67	500•23	46•61	1037•67	500•23	500•23	46•61	46•61	200•03	200•03	20•03	20•03	1014•07	1014•07	27•04	27•04	1014•07	1014•07	46•70												
CYI (S) USB-30*	2	23	7	20	2	23	17	5	9	44	20•03	1037•67	500•23	46•61	1037•67	500•23	500•23	46•61	46•61	200•03	200•03	20•03	20•03	1014•07	1014•07	27•04	27•04	1014•07	1014•07	46•70												
CRO (S) USB-30*	2	23	14	50	2	23	25	17	10	29	20•03	1037•67	500•23	46•61	1037•67	500•23	500•23	46•61	46•61	200•03	200•03	20•03	20•03	1014•07	1014•07	27•04	27•04	1014•07	1014•07	46•70												
CNB (S) USB-85	2	23	40	50	2	23	48	33	7	42	8•74	945•96	710•15	46•91	945•96	710•15	710•15	46•91	46•96	876•26	876•26	716•91	6•38	876•26	876•26	6•38	6•38	811•66	811•66	264•26	264•26	46•96	46•96	264•26								
USS HUNTSVILLE	2	23	46	42	2	23	53	6	6	24	33•23	811•66	264•26	46•96	811•66	264•26	264•26	46•96	46•96	210•23	210•23	992•69	992•69	352•32	352•32	46•96	46•96	210•23	210•23	992•69	992•69	352•32										
GDS (S) USB-85	2	23	46	2	23	54	47	8	45	21•07	622•66	210•23	46•96	622•66	210•23	210•23	46•96	46•96	200•19	200•19	843•31	843•31	200•19	200•19	843•31	843•31	200•19	200•19	843•31	843•31	200•19											
GYM (S) USB-30*	2	23	47	38	2	23	55	48	8	10	21•07	622•66	210•23	46•96	622•66	210•23	210•23	46•96	46•96	200•19	200•19	843•31	843•31	200•19	200•19	843•31	843•31	200•19	200•19	843•31	843•31	200•19										
TEX (S) USB-30*	2	23	49	0	2	23	57	33	6	33	91•12	752•28	49•87	47•06	752•28	49•87	752•28	49•87	47•06	827•33	827•33	293•87	22•01	61•0•14	61•0•14	368•66	368•66	727•51	727•51	254•91	254•91	47•13	47•13	47•13	47•13	47•13	47•13	47•13				
MIL (S) USB-30*	2	23	52	12	3	0	1	5	7	53	22•01	876•26	46•96	46•96	876•26	46•96	876•26	46•96	46•96	16•20	16•20	61•0•14	61•0•14	61•0•14	61•0•14	47•06	47•06	47•06	47•06	47•06	47•06	47•06										
GBM (S) USB-30*	2	23	54	1	3	0	1	23	7	22	24•07	727•51	254•91	47•06	727•51	254•91	254•91	47•06	47•06	24•73	24•73	14•30	14•30	14•30	14•30	24•73	24•73	14•30	14•30	24•73	24•73	14•30										
BDA (S) USB-30*	2	23	56	55	3	0	4	37	7	41	24•07	727•51	254•91	47•06	727•51	254•91	254•91	47•06	47•06	24•07	24•07	622•07	622•07	622•07	622•07	622•07	622•07	622•07	622•07	622•07	622•07	622•07										
USS VANGUARD	3	0	44	3	0	44	3	0	7	57	7•13	752•28	49•87	47•06	752•28	49•87	752•28	49•87	47•06	7•13	7•13	7•13	7•13	7•13	7•13	7•13	7•13	7•13	7•13	7•13	7•13	7•13	7•13	7•13	7•13	7•13	7•13					
CYI (S) USB-30*	3	0	46	46	3	0	44	3	0	40	7•13	752•28	49•87	47•06	752•28	49•87	752•28	49•87	47•06	7•13	7•13	7•13	7•13	7•13	7•13	7•13	7•13	7•13	7•13	7•13	7•13	7•13	7•13	7•13	7•13	7•13	7•13	7•13				
CRO (S) USB-30*	3	0	42	59	3	0	53	21	10	22	24•05	1010•84	459•71	47•61	1010•84	459•71	459•71	47•61	47•61	1080•41	1080•41	876•00	7•02	7•02	14•30	14•30	14•30	14•30	14•30	14•30	14•30	14•30	14•30	14•30	14•30	14•30	14•30	14•30	14•30	14•30	14•30	14•30
CNB (S) USB-85*	3	0	50	51	3	0	59	9	8	17	24•05	1010•84	459•71	47•61	1010•84	459•71	459•71	47•61	47•61	1080•41	1080•41	876•00	7•02	7•02	14•30	14•30	14•30	14•30	14•30	14•30	14•30	14•30	14•30	14•30	14•30	14•30	14•30	14•30	14•30	14•30	14•30	14•30
HAW (S) USB-30*	3	1	10	12	3	1	18	31	8	18	14•30	14•30	14•30	14•30	14•30	14•30	14•30	14•30	14•30	73•70	73•70	1079•63	1079•63	1079•63	1079•63	1079•63	1079•63	1079•63	1079•63	1079•63	1079•63	1079•63	1079•63	1079•63	1079•63	1079•63	1079•63	1079•63	1079•63	1079•63		
USS HUNTSVILLE	3	1	15	26	3	1	23	53	8	27	14•30	14•30	14•30	14•30	14•30	14•30	14•30	14•30	14•30	15•94	15•94	935•48	935•48	935•48	935•48	935•48	935•48	935•48	935•48	935•48	935•48	935•48	935•48	935•48	935•48	935•48	935•48	935•48	935•48	935•48		
GYM (S) USB-30*	3	1	21	15	3	1	27	55	6	39	14•30	14•30	14•30	14•30	14•30	14•30	14•30	14•30	14•30	23•70	23•70	14•30	14•30	14•30	14•30	14•30	14•30	14•30	14•30	14•30	14•30	14•30	14•30	14•30	14•30	14•30	14•30	14•30	14•30	14•30		

TABLE VIII.- ALTERNATE MISSION 3c DESCRIPTION

(a) Maneuver plan

Event	Rev no	g.e.t., day:hr:min	Burn time, sec	ΔV , fps			IMU alignment	Resultant ellipse, h_a/h_p , n. mi.	TVC mode		Station contact	Comments
				Total	ΔV_x	ΔV_y			primary	secondary		
Orbit insertion COI	1		39				Launch	122/126	SCS	MTVC	EIR	
First SPS burn	17	00:23:46	0.5	15	0	0	Preferred	120/132	GNCS	None	MIL	Minimum impulse test
Second SPS burn	19	01:02:54	40.2	868	237	818	Preferred	117/278	GNCS/MTVC	SCS	MIL	Place perigee in northern hemisphere and set up RCS back-up deorbit capability for touchdown in revolution 48
Third SPS burn	32	02:00:08	0.5	15	15	0	Preferred	117/283	GNCS	None	MIL	Minimum impulse test
Fourth SPS burn	46	03:00:19	16.5	394	-237	0	Deorbit		GNCS	SCS	HAW	Deorbit burn $t_f = 17$ min

TABLE VIII.- ALTERNATE MISSION 3c DESCRIPTION - Continued
 (b) CSM lighting summary

(ASSUMED LIFTOFF TIME = YEAR 1968 MONTH 8 DAY 0 HR 0 MIN 12 SEC 27.60)

START IN LIGHT AT T = DAY 0			MIN 12 SEC 27.60			SUN-LIGHT, EARTH-SHIELD			
START IN LIGHT AT T = DAY 0			MIN 12 SEC 27.60			MOON-LIGHT, EARTH-SHIELD			
-----SUNRISE-----			-----MOONRISE-----			-----MOONSET-----			REVOLUTION
D H M	S	LONG	D H M	S	LONG	D H M	S	LONG	
0 1 16	23.85	-168.20	0 0 39	37.69	47.93	0 1 37	19.15	-92.10	2.37
0 2 45	23.60	169.83	0 2 8	37.27	25.95	0 2 29	6.52	109.59	2.59
0 4 14	12.93	147.32	0 3 37	24.12	3.32	0 3 6	19.31	-113.77	2.74
0 5 43	8.78	125.18	0 5 6	22.60	*18.67	0 4 35	29.39	*134.65	2.98
0 7 12	.29	102.83	0 6 35	9.93	-41.23	0 6 4	26.75	-156.46	3.21
0 8 40	50.99	80.46	0 8 4	3.15	-63.46	0 7 33	37.59	-177.21	3.31
0 10 9	45.65	56.32	0 9 32	55.19	-85.72	0 9 2	34.16	160.98	3.47
0 11 38	29.63	35.65	0 11 1	43.84	-108.14	0 10 31	43.95	140.22	3.62
0 13 7	28.54	13.77	0 12 30	39.94	-130.15	0 12 52	31.85	-39.78	3.77

TABLE VIII.- ALTERNATE MISSION 3c DESCRIPTION - Continued
 (b) CSM lighting summary - Continued

SUNRISE			MOONRISE			MOONSET			REVOLUTION			
D	H	M	S	LONG	D	H	M	S	LONG	D	H	M
0	13	59	24.66	-152.73	0	13	29	48.61	97.65	0	14	21
0	14	36	14.77	-8.75	0	14	58	46.98	76.12	0	15	50
0	16	5	8.30	-30.86	0	16	28	19.91	-174.74	0	17	33
0	17	33	57.54	-53.18	0	18	25	54.51	140.48	0	18	48
0	19	2	43.81	-75.63	0	19	54	46.44	118.37	0	19	25
0	20	31	37.58	-97.67	0	21	23	30.40	95.86	0	20	54
0	22	0	20.72	-120.24	0	22	52	24.92	73.93	0	22	23
0	23	29	14.00	-142.25	1	0	21	15.60	51.72	0	23	52
1	0	58	4.58	-164.93	1	1	50	19.70	29.81	1	1	21
1	2	27	5.88	172.98	1	3	20	7.12	9.79	1	2	51
1	3	56	32.90	144.29	1	4	51	46.54	-13.21	1	4	22
1	5	28	14.75	121.37	1	6	23	27.20	-36.13	1	5	54
1	6	59	55.49	98.41	1	7	55	8.84	-59.00	1	6	24
1	8	31	34.87	75.38								

TABLE VIII.- ALTERNATE MISSION 3c DESCRIPTION - Continued

(b) CSM lighting summary - Continued

SUNRISE				MOONSET				MOONSET				REVOLUTION			
D	H	M	S	D	H	M	S	D	H	M	S	D	H	M	S
1	9	26	51.026	-81.81	1	8	58	29.023	177.58	1	9	53	27.68	22.31	22.72
1	10	3	12.60	52.29	1	10	58	26.017	-105.01	1	10	30	21.092	155.68	23.02
1	11	34	49.03	29.13	1	12	30	3.08	-128.09	1	12	2	14.024	133.75	23.30
1	13	6	30.78	6.026	1	14	1	41.071	-151.07	1	13	34	6.013	111.80	23.66
1	14	38	11.50	-16.66	1	15	33	21.066	-173.96	1	15	5	57.056	89.82	23.94
1	16	9	50.96	-39.63	1	17	5	2.66	163.21	1	16	37	48.045	67.81	24.24
1	17	41	28.06	-62.67	1	18	36	41.012	140.26	1	18	9	38.074	45.76	24.50
1	19	13	4.84	-85.80	1	20	8	15.55	117.10	1	19	41	28.033	23.68	24.76
1	20	44	42.21	-108.84	1	21	39	52.23	94.07	1	21	13	17.009	1.54	25.02
1	22	16	22.64	-131.073	1	23	11	30.60	71.15	1	22	45	4.088	-20.66	25.37
1	23	48	1.85	-154.66	2	0	43	15.96	48.51	2	0	16	57.015	-42.55	25.73
2	1	19	46.25	-177.086	2	2	15	3.73	25.54	2	1	48	56.80	-64.66	26.02
2	2	51	34.32	159.13	2	3	46	51.082	2.60	2	3	20	56.026	-86.78	26.31
2	4	23	21.78	136.10						2	4	16	8.03	114.056	26.61

TABLE VIII.- ALTERNATE MISSION 3c DESCRIPTION - Continued
 (b) CSM lighting summary - Concluded

D H M S	LONG	SUNSET			MOONRISE			MOONSET			REVOLUTION	
		D	H	M	S	LONG	D	H	M	S		
2 5 55 0.57	113.04	2	5	18	40.17	-20.32	2	4	52	55.53	-108.90	34.94
2 7 26 54.59	89.96	2	6	50	28.76	-43.21	2	6	24	54.61	-131.04	35.19
2 8 58 39.72	66.83	2	8	22	14.58	-66.24	2	7	56	53.50	-153.19	35.48
2 10 30 23.82	43.64	2	9	53	58.27	-89.38	2	9	28	52.19	-175.36	35.55
2 12 2 11.83	20.71	2	11	25	42.80	-112.47	2	11	0	50.69	162.47	36.00
2 13 33 59.54	-2.25	2	12	57	28.05	-135.50	2	12	32	48.98	140.29	36.12
2 15 5 46.69	-25.23	2	14	29	13.90	-158.48	2	14	4	47.06	118.10	36.42
2 16 37 33.20	-48.24	2	16	1	.25	178.57	2	15	36	44.93	95.89	36.49
2 18 9 18.97	-71.27	2	17	32	47.03	155.66	2	17	8	42.58	73.68	36.81
2 19 41 3.92	-94.33	2	19	4	34.08	132.78	2	18	40	39.99	51.45	37.01
2 21 12 47.89	-117.44	2	20	36	20.78	109.88	2	20	12	37.16	29.20	37.04
2 22 44 30.72	-140.59	2	22	8	2.27	86.71	2	21	44	34.08	6.95	37.42
3 0 14 14.34	-163.70	2	23	39	44.93	63.61	2	23	16	30.73	-15.32	37.47
		3	0	11	51.27	-176.65						37.50

TABLE VIII.- ALTERNATE MISSION 3c DESCRIPTION - Continued
 (c) Radar acquisition and loss summary for CSM

MSFN STATION	ACQUISITION	LOSS	ELAPSED TIME	MAX ELEVATION	MAX RANGE	MIN RANGE	REVOLUTION NUMBER
NAME	DAY HR MIN SEC	DAY HR MIN SEC	MIN SEC	DEG	N MI	N MI	
BDA (S) USB-30*	0 0 12 26	0 0 13 39	1 12	4° 8.2	684.80	673.35	2.11
USS VANGUARD	0 0 12 26	0 0 17 16	4 50	29° 6.2	764.14	231.70	2.15
CYI (S) USB-30*	0 0 16 45	0 0 24 28	7 42	35° 0.3	541.03	201.26	2.22
CRO (S) USB-30*	0 0 52 36	0 0 59 46	7 10	12° 6.6	698.77	443.55	2.59
CNB (S) USB-85*	0 1 0 16	0 1 6 42	6 26	7° 1.4	889.16	592.85	2.68
USS HUNTSVILLE	0 1 24 2	0 1 30 41	6 39	8° 7.2	882.81	530.21	2.91
GDS (S) USB-85*	0 1 29 30	0 1 35 21	5 50	6° 29	781.19	611.08	2.94
GYM (S) USB-30*	0 1 29 3	0 1 36 59	7 56	38° 7.7	822.92	186.57	2.98
WHS-15 (FPPS-1.6M)	0 1 30 35	0 1 38 7	7 32	22° 7.9	584.49	283.19	2.98
TEX (S) USB-30*	0 1 32 5	0 1 39 57	7 52	31° 5.1	835.60	220.21	3.01
MIL (S) USB-30*	0 1 35 58	0 1 43 46	7 48	23° 6.2	812.70	277.07	3.06
GBM (S) USB-30*	0 1 36 41	0 1 44 8	7 27	18° 35	593.78	335.89	3.06
ANG-91 USB-30	0 1 43 14	0 1 46 12	2 57	1° 47	830.54	630.54	3.08
BDA (S) USB-30*	0 1 39 24	0 1 47 22	7 58	26° 3.6	741.78	253.84	3.10
USS VANGUARD	0 1 43 9	0 1 50 39	7 30	19° 5.8	885.28	318.93	3.15
CYI (S) USB-30*	0 1 51 42	0 1 56 32	4 50	3° 6.5	902.76	717.08	3.20
CRO (S) USB-30*	0 2 26 32	0 2 34 10	7 37	21° 44	591.64	305.60	3.59
HAW (S) USB-30*	0 2 51 57	0 2 59 12	7 15	12° 5.8	804.06	430.47	3.64
USS HUNTSVILLE	0 2 57 0	0 3 4	7 55	42° 4.2	834.04	173.86	3.91
GDS (S) USB-85*	0 3 2 6	0 3 9 36	7 29	17° 1.6	839.08	350.99	3.96
GYM (S) USB-30*	0 3 3 0	0 3 10 45	7 44	26° 5.7	870.95	252.15	3.98
WHS-15 (FPPS-1.6M)	0 3 4 3	0 3 11 59	7 55	41° 57	826.27	176.10	3.98
TEX (S) USB-30*	0 3 6 12	0 3 13 51	7 38	21° 2.3	861.06	300.47	4.01
MIL (S) USB-30*	0 3 9 51	0 3 17 47	7 56	30° 5.0	787.30	225.3	4.05
GBM (S) USB-30*	0 3 10 36	0 3 18 19	7 42	31° 8.4	525.04	217.49	4.05
BDA (S) USB-30*	0 3 13 20	0 3 20 34	7 13	14° 6.9	900.42	390.97	4.10
ANG-91 USB-30	0 3 15 38	0 3 22 23	6 45	9° 9.1	760.66	495.34	4.10
USS VANGUARD	0 3 17 59	0 3 22 40	4 41	3° 4.6	884.74	726.61	4.12
ACN (S) USB-30*	0 3 29 22	0 3 36 34	7 12	14° 4.5	902.17	392.46	4.24
CRO (S) USB-30*	0 4 0 15	0 4 8 8	7 53	37° 8.9	878.52	193.06	4.58
HAW (S) USB-30*	0 4 25 23	0 4 33 8	7 45	21° 5.1	791.26	294.98	4.64
USS HUNTSVILLE	0 4 31 18	0 4 38 33	7 15	14° 4.4	905.89	396.68	4.91
GDS (S) USB-85*	0 4 35 31	0 4 43 13	7 41	18° 7.3	774.92	328.82	4.96
GYM (S) USB-30*	0 4 37 0	0 4 44 45	7 44	27° 2.8	867.53	246.33	4.98
WHS-15 (FPPS-1.6M)	0 4 37 47	0 4 45 41	7 54	27° 6.4	772.09	242.15	4.98
TEX (S) USB-30*	0 4 40 1	0 4 47 56	7 55	37° 7.2	821.6	189.71	5.01
MIL (S) USB-30*	0 4 43 43	0 4 51 18	7 34	15° 8.2	763.94	369.87	5.05
GBM (S) USB-30*	0 4 44 28	0 4 52 4	7 36	26° 4.5	906.68	250.55	5.05
BDA (S) USB-30*	0 4 49 20	0 4 51 19	1 58	9° 9.3	855.23	655.23	5.05
ANG-91 USB-30	0 4 48 58	0 4 56 45	7 47	36° 7.8	860.45	191.92	5.10

TABLE VIII.- ALTERNATE MISSION 3c DESCRIPTION - Continued
(c) Radar acquisition and loss summary for CSM - Continued

MSFN STATION NAME	ACQUISITION			LOSS			ELAPSED TIME			MAX ELEVATION			MIN RANGE			REVOLUTION NUMBER		
	DAY	HR	MIN	SEC	DAY	HR	MIN	SEC	MIN	SEC	DEG	N MI	N MI	N MI	N MI	N MI	N MI	
ACN (S) USB-30*	0	5	3	6	0	5	39	53	7	11	14.15	450.80	400.67	5.21	5.55	5.55	5.55	
CRO (S) USB-30*	0	5	35	23	0	5	53	37	4	29	2.77	787.82	765.17	5.66	5.66	5.66	5.66	
GWH (S) USB-30*	0	5	45	53	0	5	53	37	7	44	21.76	790.46	292.47	5.84	5.84	5.84	5.84	
HAW (S) USB-30*	0	6	0	11	0	6	34	6	22	7.19	902.25	578.17	5.91	5.91	5.91	5.91		
USS HUNTSVILLE	0	6	5	32	0	6	12	42	7	9	12.62	878.40	432.14	5.93	5.93	5.93	5.93	
GDS (S) USB-85*	0	6	9	22	0	6	16	19	6	56	11.91	707.27	445.22	5.95	5.95	5.95	5.95	
GYH (S) USB-30*	0	6	10	48	0	6	18	36	7	47	16.87	890.84	160.56	5.98	5.98	5.98	5.98	
WHS-15 (FPP-16H)	0	6	11	48	0	6	18	41	6	53	10.67	873.45	473.43	5.99	5.99	5.99	5.99	
MIL (S) USB-30*	0	6	19	36	0	6	22	20	2	43	1.20	839.20	839.20	5.99	5.99	5.99	5.99	
TEX (S) USB-30*	0	6	14	0	0	6	21	15	7	15	12.91	818.69	422.47	5.99	5.99	5.99	5.99	
GBM (S) USB-30*	0	6	19	58	0	6	23	15	3	14	1.30	851.64	832.53	6.01	6.01	6.01	6.01	
ANG-91 USB-30	0	6	25	19	0	6	27	34	2	15	1.12	842.34	842.34	6.05	6.05	6.05	6.05	
USS MERCURY	0	7	18	19	0	7	23	7	4	48	3.65	882.36	717.72	6.63	6.63	6.63	6.63	
GWH (S) USB-30*	0	7	20	9	0	7	26	54	6	45	8.69	848.73	529.48	6.67	6.67	6.67	6.67	
HAW (S) USB-30*	0	7	34	41	0	7	40	48	6	6	6.41	862.93	604.58	6.84	6.84	6.84	6.84	
GDS (S) USB-85*	0	7	45	2	0	7	47	12	2	10	.91	853.74	853.74	6.90	6.90	6.90	6.90	
USS HUNTSVILLE	0	7	39	13	0	7	47	5	52	28.01	797.01	234.32	6.90	6.90	6.90	6.90		
GYH (S) USB-30*	0	7	45	21	0	7	51	8	5	47	6.13	805.53	612.47	6.94	6.94	6.94	6.94	
USS MERCURY	0	8	50	20	0	8	58	8	7	47	40.43	879.38	179.37	7.62	7.62	7.62	7.62	
HAW (S) USB-30*	0	9	8	15	0	9	15	39	7	24	16.52	864.15	356.57	7.63	7.63	7.63	7.63	
USS HUNTSVILLE	0	9	13	14	0	9	20	21	7	7	14.06	671.37	398.58	7.67	7.67	7.67	7.67	
USS MERCURY	0	10	24	18	0	10	31	49	7	30	18.87	875.51	326.69	8.42	8.42	8.42	8.42	
HAW (S) USB-30*	0	10	41	52	0	10	49	33	7	41	21.24	784.87	293.52	8.82	8.82	8.82	8.82	
USS MERCURY	0	11	58	39	0	12	5	41	7	2	12.31	697.64	436.95	9.63	9.63	9.63	9.63	
HAW (S) USB-30*	0	12	18	13	0	12	19	33	1	20	.39	879.45	879.45	9.77	9.77	9.77	9.77	
USS REDSTONE	0	12	30	52	0	12	38	25	7	33	22.47	579.61	287.64	9.74	9.74	9.74	9.74	
ACN (S) USB-30*	0	12	57	22	0	13	3	24	6	1	6.72	771.18	596.70	10.24	10.24	10.24	10.24	
USS MERCURY	0	13	32	30	0	13	40	2	7	31	22.45	599.85	284.30	10.62	10.62	10.62	10.62	
GWH (S) USB-30*	0	13	38	47	0	13	44	58	6	10	7.02	829.16	578.29	10.68	10.68	10.68	10.68	
USS REDSTONE	0	14	4	32	0	14	12	14	7	43	29.44	551.30	234.57	10.94	10.94	10.94	10.94	
ACN (S) USB-30*	0	14	30	18	0	14	38	5	7	47	37.45	873.32	189.39	11.21	11.21	11.21	11.21	
USS MERCURY	0	15	6	10	0	15	15	52	7	42	27.57	843.48	239.79	11.61	11.61	11.61	11.61	
GWH (S) USB-30*	0	15	11	46	0	15	19	37	7	50	26.92	759.53	213.19	11.67	11.67	11.67	11.67	
USS REDSTONE	0	15	38	50	0	15	46	1	7	11	13.35	643.97	423.71	11.95	11.95	11.95	11.95	
USS MERCURY	0	16	41	39	0	16	45	9	3	29	1.53	831.06	816.44	12.58	12.58	12.58	12.58	
GWH (S) USB-30*	0	16	47	59	0	16	50	37	2	38	.81	889.78	855.45	12.63	12.63	12.63	12.63	
USS REDSTONE	0	17	12	47	0	17	20	16	7	28	17.95	586.86	345.19	12.95	12.95	12.95	12.95	
CYI (S) USB-30*	0	17	42	20	0	17	49	28	7	8	1.29	874.33	413.53	13.24	13.24	13.24	13.24	
MAD (S) USB-85*	0	17	48	14	0	17	50	42	2	28	.44	887.19	879.85	13.26	13.26	13.26	13.26	
CNB (S) USB-85*	0	18	30	4	0	18	30	47	0	41	.31	893.25	893.25	13.68	13.68	13.68	13.68	
USS REDSTONE	0	18	46	29	0	18	54	20	7	50	70.96	919.90	127.23	13.94	13.94	13.94	13.94	
ANG-91 USB-30	0	19	4	55	0	19	11	40	6	45	10.63	701.72	971.92	14.10	14.10	14.10	14.10	
USS YANGUARD	0	19	12	19	0	19	13	24	1	4	.26	890.81	890.81	14.12	14.12	14.12	14.12	
CYI (S) USB-30*	0	19	15	28	0	19	23	24	7	55	25.41	729.60	257.37	14.24	14.24	14.24	14.24	
MAD (S) USB-85*	0	19	19	32	0	19	25	9	57	6.75	754.61	589.17	14.27	14.27	14.27	14.27		
CRO (S) USB-30*	0	19	52	27	0	19	57	46	5	18	4.50	897.20	676.61	14.59	14.59	14.59	14.59	
CNB (S) USB-85*	0	20	4	4	0	20	6	48	9.14	853.91	519.71	14.71	14.71	14.71	14.71			
USS REDSTONE	0	20	20	57	0	20	26	46	5	49	5.81	865.56	428.24	14.92	14.92	14.92	14.92	
GBH (S) USB-30*	0	20	37	38	0	20	41	32	3	54	1.97	807.21	796.01	15.05	15.05	15.05	15.05	

TABLE VIII.- ALTERNATE MISSION 3c DESCRIPTION - Continued

(c) Radar acquisition and loss summary for CSM - Continued

MSFN STATION NAME	ACQUISITION DAY HR MIN SEC	LOSS DAY HR MIN SEC	ELAPSED TIME MIN SEC	MAX ELEVATION DEG	MIN RANGE NM	REVOLUTION NUMBER
BDA (S) USB-30*	0 20 40 40	0 20 38 3	0 20 45 44	4 44	721*07	15*10
ANG-91 USB-30	0 20 42 53	0 20 50 0	7 7	2*64	278*94	15*10
USS VANGUARD	0 20 49 29	0 20 57 7	7 7	14*29	625*67	15*15
CYI (S) USB-30*	0 20 52 38	0 20 58 46	7 7	18*45	394*19	15*24
MAD (S) USB-85*	0 21 24 39	0 21 32 27	6 7	6*74	790*96	15*27
CRO (S) USB-30*	0 21 33 1	0 21 40 37	7 7	58*47	861*67	15*59
CNB (S) USB-85*	0 22 6 50	0 22 11 25	4 35	498*05	498*05	15*59
TEX (S) USB-30*	0 22 8 59	0 22 16 15	7 15	16*32	896*68	15*71
MIL (S) USB-30*	0 22 9 4	0 22 16 45	7 40	27*72	788*84	16*01
GFM (S) USB-30*	0 22 13 24	0 22 18 26	5 1	3*84	734*02	16*05
ANG-91 USB-30	0 22 16 28	0 22 20 7	7 29	22*12	613*91	16*07
BDA (S) USB-30*	0 22 16 2	0 22 23 53	7 50	3*378	358*80	16*07
USS VANGUARD	0 22 18 0	0 22 31 6	7 48	26*28	239*13	16*07
CYI (S) USB-30*	0 22 26 47	0 22 30 50	4 3	2*55	763*64	16*24
MAD (S) USB-85*	0 22 26 47	0 22 30 50	4 3	857*78	600*80	16*59
CRO (S) USB-30*	0 22 58 39	0 23 6 7	7 28	18*69	331*99	16*59
CNB (S) USB-85*	0 23 6 37	0 23 14 5	7 28	19*70	600*80	16*68
GYM (S) USB-30*	0 23 6 29	0 23 42 59	6 29	9*63	904*08	16*96
WHS-15 (FPS-16H)	0 23 38 21	0 23 43 55	5 34	5*63	899*17	16*97
TEX (S) USB-30*	0 23 38 42	0 23 46 16	7 34	34*40	907*16	17*00
MIL (S) USB-30*	0 23 42 22	0 23 50 7	7 44	63*44	905*45	17*05
GFM (S) USB-30*	0 23 42 54	0 23 50 26	7 32	27*02	893*56	17*07
ANG-91 USB-30	0 23 50 10	0 23 50 28	0 18	*13	898*59	17*07
BDA (S) USB-30*	0 23 46 4	0 23 53 52	7 47	47*77	907*43	17*10
USS VANGUARD	0 23 49 38	0 23 57 31	7 53	29*82	777*00	17*15
CYI (S) USB-30*	0 23 57 2	0 24 0 40	7 38	22*00	841*25	17*23
CRO (S) USB-30*	0 23 52 49	0 24 10 12	7 22	13*60	677*24	17*59
CNB (S) USB-85*	0 24 0 40	0 24 0 46	6 13	6*84	843*58	17*67
USS HUNTSVILLE	0 24 1 1	0 24 1 13	7 2	12*44	886*55	17*90
GDS (S) USB-85*	0 24 1 9	0 24 1 15	6 11	7*53	786*89	17*95
GTM (S) USB-30*	0 24 1 9	0 24 1 17	7 55	26*55	730*87	17*98
TEX (S) USB-30*	0 24 1 12	0 24 1 20	7 40	32*69	523*45	18*00
WHS-15 (FPS-16H)	0 24 1 10	0 24 1 18	7 34	26*08	894*64	18*00
MIL (S) USB-30*	0 24 1 16	0 24 1 24	7 38	28*82	543*07	18*05
GFM (S) USB-30*	0 24 1 17	0 24 1 24	7 22	16*87	886*38	18*07
BDA (S) USB-30*	0 24 1 19	0 24 1 27	7 50	33*07	815*10	18*10
ANG-91 USB-30	0 24 1 23	0 24 1 26	3 32	1*60	840*75	18*10
USS VANGUARD	0 24 1 23	0 24 1 30	7 19	13*46	799*69	18*14
CYI (S) USB-30*	0 24 1 32	0 24 1 36	3 31	1*93	803*03	18*18
CRO (S) USB-30*	0 24 1 4	0 24 1 41	7 56	24*45	866*69	18*60
HAW (S) USB-30*	0 24 1 2	0 24 1 29	7 27	21*05	898*42	18*83
USS HUNTSVILLE	0 24 1 2	0 24 1 32	16 1	26*76	743*66	18*89
GDS (S) USB-85*	0 24 1 2	0 24 1 45	13 1	21*64	904*72	18*95
GYM (S) USB-30*	0 24 1 2	0 24 1 49	51 7	21*65	891*94	18*96
WHS-15 (FPS-16H)	0 24 1 2	0 24 1 51	5 7	71*24	897*96	18*98
TEX (S) USB-30*	0 24 1 4	0 24 1 52	12 7	24*05	907*20	19*00
MIL (S) USB-30*	0 24 1 50	0 24 1 54	9 7	62*69	894*57	19*05
GFM (S) USB-30*	0 24 1 51	0 24 1 58	5 7	39*51	902*51	19*05
BDA (S) USB-30*	0 24 1 53	0 24 1 59	7 35	10*79	908*97	19*07

TABLE VIII.- ALTERNATE MISSION 3c DESCRIPTION - Continued
 (c) Radar acquisition and loss summary for CSM - Continued

MSFN STATION NAME	ACQUISITION			LOSS			ELAPSED TIME			MAX ELEVATION			MIN RANGE			REVOLUTION		
	DAY	HR	MIN	SEC	DAY	HR	MIN	SEC	MIN	SEC	DEG	N	MI	N	MI	N	MI	NUMBER
USS VANGUARD	1	2	59	44	1	3	1	24	1	40	•71	853.35	853.35	19.09	19.09	19.09	19.09	
ANG-71 USB-30*	1	2	55	53	1	3	2	58	7	4	13.48	882.83	398.00	19.11	19.11	19.11	19.11	
ACN (S) USB-30*	1	3	9	5	1	3	18	1	6	56	40.99	871.85	222.50	19.24	19.24	19.24	19.24	
CRO (S) USB-30*	1	3	39	52	1	3	52	6	12	13	38.01	1210.32	419.02	19.59	19.59	19.59	19.59	
GWH (S) USB-30*	1	3	53	53	1	4	3	23	9	29	42.24	1190.31	761.37	19.70	19.70	19.70	19.70	
HAW (S) USB-30*	1	4	7	50	1	4	16	44	8	53	20.87	967.17	407.84	19.82	19.82	19.82	19.82	
USS HUNTSVILLE	1	4	14	21	1	4	22	5	7	44	13.24	965.23	475.16	19.90	19.90	19.90	19.90	
GDS (S) USB-95*	1	4	16	35	1	4	26	28	7	52	27.86	941.17	252.12	19.95	19.95	19.95	19.95	
GYH (S) USB-30*	1	4	20	15	1	4	28	9	7	54	27.61	849.86	245.31	19.97	19.97	19.97	19.97	
WHS-15 (FPPS-16M)	1	4	21	0	1	4	28	45	7	45	38.81	550.84	186.25	19.97	19.97	19.97	19.97	
TEX (S) USB-30*	1	4	23	16	1	4	31	4	7	47	46.75	850.65	158.02	20.01	20.01	20.01	20.01	
MIL (S) USB-30*	1	4	27	13	1	4	34	11	6	57	13.22	649.62	403.11	20.03	20.03	20.03	20.03	
GBM (S) USB-30*	1	4	27	51	1	4	34	55	7	4	4.11	891.58	386.40	20.05	20.05	20.05	20.05	
ANG-71 USB-30*	1	4	32	28	1	4	39	56	7	27	15.53	827.66	362.36	20.09	20.09	20.09	20.09	
ACN (S) USB-30*	1	4	46	16	1	4	54	29	8	13	0.62	961.69	667.66	20.22	20.22	20.22	20.22	
CRO (S) USB-30*	1	4	58	12	1	5	26	51	8	38	7.63	1339.47	993.07	20.57	20.57	20.57	20.57	
USS MERCURY	1	5	31	13	1	5	34	39	3	25	1.15	1201.32	1201.32	20.42	20.42	20.42	20.42	
GWH (S) USB-30*	1	5	29	56	1	5	40	42	10	46	45.03	1124.45	298.07	20.47	20.47	20.47	20.47	
HAW (S) USB-30*	1	5	46	15	1	5	52	59	6	43	6.79	952.24	671.02	20.84	20.84	20.84	20.84	
USS HUNTSVILLE	1	5	51	43	1	5	59	4	7	21	13.44	859.20	429.52	20.91	20.91	20.91	20.91	
GDS (S) USB-95*	1	5	55	42	1	6	2	6	6	24	8.83	724.29	515.12	20.93	20.93	20.93	20.93	
GYH (S) USB-30*	1	5	57	8	1	6	4	39	7	30	27.34	552.33	235.55	20.95	20.95	20.95	20.95	
WHS-15 (FPPS-16M)	1	5	58	19	1	6	4	19	6	0	6.95	614.87	567.82	20.96	20.96	20.96	20.96	
TEX (S) USB-30*	1	6	0	36	1	6	6	50	6	13	7.26	853.54	558.21	20.97	20.97	20.97	20.97	
USS MERCURY	1	7	4	29	1	7	14	9	9	39	18.80	1202.06	724.06	21.43	21.43	21.43	21.43	
GWH (S) USB-30*	1	7	8	29	1	7	16	20	7	51	8.92	1150.03	724.06	21.46	21.46	21.46	21.46	
HAW (S) USB-30*	1	7	23	49	1	7	30	15	6	26	7.96	787.63	566.42	21.83	21.83	21.83	21.83	
USS HUNTSVILLE	1	7	28	30	1	7	36	14	7	45	45.69	849.43	157.15	21.89	21.89	21.89	21.89	
GYH (S) USB-30*	1	7	35	48	1	7	38	55	3	6	1.46	900.15	814.20	21.93	21.93	21.93	21.93	
USS REDSTONE	1	8	41	9	1	8	50	46	9	36	45.25	831.41	236.65	22.02	22.02	22.02	22.02	
HAW (S) USB-30*	1	8	49	20	1	9	7	57	7	37	23.84	811.48	260.40	22.05	22.05	22.05	22.05	
USS MUNTVILLE	1	9	5	58	1	9	11	41	5	42	6.05	781.15	606.93	22.87	22.87	22.87	22.87	
USS MERCURY	1	10	19	0	1	10	27	5	8	5	1.60	924.31	459.22	23.64	23.64	23.64	23.64	
USS REDSTONE	1	10	37	21	1	10	44	5	4	44	10.97	692.37	456.64	23.81	23.81	23.81	23.81	
ACN (S) USB-30*	1	12	54	18	1	11	0	37	8	9	11.42	984.69	632.05	23.96	23.96	23.96	23.96	
USS MERCURY	1	12	56	35	1	11	27	30	8	54	7.80	1353.35	1007.50	24.25	24.25	24.25	24.25	
GWH (S) USB-30*	1	12	57	37	1	12	4	12	7	22	13.05	957.77	444.03	24.63	24.63	24.63	24.63	
USS REDSTONE	1	14	4	47	1	12	7	0	2	13	.25	897.73	879.24	24.67	24.67	24.67	24.67	
ACN (S) USB-30*	1	14	38	41	1	12	38	26	10	33	95.00	948.39	203.67	24.96	24.96	24.96	24.96	
USS MERCURY	1	15	10	32	1	13	6	18	11	59	39.53	1297.00	397.45	25.24	25.24	25.24	25.24	
GWH (S) USB-30*	1	15	14	35	1	13	41	7	7	44	33.52	838.27	204.01	25.43	25.43	25.43	25.43	
USS MERCURY	1	15	19	0	1	14	46	41	7	21	19.64	590.94	305.28	25.67	25.67	25.67	25.67	
USS REDSTONE	1	14	4	52	1	14	15	40	10	48	24.72	1193.97	497.78	26.97	26.97	26.97	26.97	
ACN (S) USB-30*	1	14	38	42	1	14	42	32	10	53	21.01	1160.38	589.69	26.42	26.42	26.42	26.42	
USS MERCURY	1	15	10	32	1	15	17	9	6	36	8.70	848.72	511.51	26.41	26.41	26.41	26.41	
GWH (S) USB-30*	1	15	14	56	1	15	23	7	6	57	10.19	920.41	495.38	26.66	26.66	26.66	26.66	
USS REDSTONE	1	14	14	52	1	15	53	16	11	20	24.84	1313.53	529.87	26.98	26.98	26.98	26.98	
CYI (S) USB-30*	1	14	15	46	1	14	23	19	9	4	13.62	1167.28	643.94	27.25	27.25	27.25	27.25	
MAD (S) USB-95*	1	16	20	34	1	16	24	55	4	20	2.03	1145.10	1025.52	21.28	21.28	21.28	21.28	

TABLE VIII. - ALTERNATE MISSION 3c DESCRIPTION - Continued

(c) Radar acquisition and loss summary for CSM - Continued

MSFN STATION	NAME	ACQUISITION			LOSS			DAY	HR	MIN	SEC	MIN	SEC	ELAPSED TIME	MAX ELEVATION	MAX RANGE	MIN RANGE	REVOLUTION NUMBER
		DAY	HR	MIN	SEC	DEG	N MI											
USS REDSTONE	ANG-91 USB-30	1	17	18	49	1	17	30	57	12	8	52°18'	1377.02	335.18	27.98			
		1	17	39	18	1	17	48	27	9	8	10°17'	1099.82	818.38	28.11			
USS VANGUARD	ANG-91 USB-30*	1	17	47	22	1	17	51	11	3	48	1°44'	1168.96	1149.04	28.15			
CYI (S) USB-30*	ANG-91 USB-30*	1	17	50	26	1	18	0	16	9	49	40°55'	1130.07	272.52	28.24			
MAD (S) USB-30*	ANG-91 USB-30*	1	17	55	3	1	18	2	27	7	23	9°31'	829.84	648.10	28.27			
CRO (S) USB-30*	ANG-91 USB-30*	1	18	29	56	1	18	33	48	3	52	1°53'	991.00	952.85	28.60			
CNB (S) USB-85*	ANG-91 USB-30*	1	18	35	50	1	18	45	2	9	12	14°01'	1247.75	641.70	28.73			
USS REDSTONE	ANG-91 USB-30*	1	18	55	41	1	19	7	46	12	4	32°30'	1199.16	471.82	28.95			
MIL (S) USB-30*	ANG-91 USB-30*	1	19	16	42	1	19	19	32	2	49	9°72'	1272.94	1215.16	29.05			
GFM (S) USB-30*	ANG-91 USB-30*	1	19	15	19	1	19	21	31	6	12	3°88'	1143.80	1046.21	29.07			
BDA (S) USB-30*	ANG-91 USB-30*	1	19	18	38	1	19	25	24	6	46	4°95'	1227.78	936.98	29.11			
CNB (S) USB-85*	ANG-91 USB-30*	1	19	15	7	1	19	25	57	10	49	65°41'	939.76	213.64	29.11			
USS VANGUARD	ANG-91 USB-30*	1	19	20	59	1	19	29	55	8	56	14°28'	889.99	592.88	29.16			
CYI (S) USB-30*	ANG-91 USB-30*	1	19	27	48	1	19	36	37	8	48	28°20'	906.62	299.80	29.23			
MAD (S) USB-30*	ANG-91 USB-30*	1	19	31	14	1	19	38	40	7	26	11°97'	756.26	514.50	29.24			
CRO (S) USB-30*	ANG-91 USB-30*	1	20	3	23	1	20	13	5	9	41	26°67'	1181.21	383.98	29.62			
CNB (S) USB-85*	ANG-91 USB-30*	1	20	11	23	1	20	22	26	11	2	38°92'	1025.57	352.02	29.71			
USS REDSTONE	ANG-91 USB-30*	1	20	34	14	1	20	42	10	7	56	5°90'	1314°26'	1069.70	29.91			
TEA (S) USB-30*	ANG-91 USB-30*	1	20	47	27	1	20	54	27	6	59	5°38'	1122.38	971.39	30.01			
MIL (S) USB-30*	ANG-91 USB-30*	1	20	49	47	1	20	59	12	9	25	17°34'	1068.20	547.48	30.04			
GFM (S) USB-30*	ANG-91 USB-30*	1	20	49	47	1	20	59	47	9	59	26°88'	1060.64	404.65	30.08			
ANG-91 USB-30	ANG-91 USB-30	1	20	53	11	1	21	1	51	8	40	11°87'	920.62	642.20	30.10			
BDA (S) USB-30*	ANG-91 USB-30	1	20	53	37	1	21	2	55	9	18	23°32'	1043.55	405.58	30.12			
USS VANGUARD	ANG-91 USB-30	1	20	57	17	1	21	6	33	9	16	38°53'	820.86	247.68	30.15			
CYI (S) USB-30*	ANG-91 USB-30	1	21	5	14	1	21	13	16	8	2	21°94'	836.39	323.44	30.25			
MAD (S) USB-30*	ANG-91 USB-30	1	21	8	8	1	21	14	9	6	1	6°38'	857.51	633.21	30.25			
CRO (S) USB-30*	ANG-91 USB-30	1	21	39	44	1	21	50	23	10	38	39°05'	993.25	323.94	30.61			
CNB (S) USB-85*	ANG-91 USB-30	1	21	47	42	1	21	59	25	11	43	45°31'	1274.35	340.99	30.72			
GTM (S) USB-30*	ANG-91 USB-30	1	22	20	5	1	22	29	0	8	8	12°18'	1153.99	692.78	30.79			
WHS-15 (FPS-16M)	ANG-91 USB-30	1	22	22	8	1	22	29	58	7	50	7°83'	1140.19	805.90	30.99			
TEX (S) USB-30*	ANG-91 USB-30	1	22	22	22	1	22	32	19	9	57	26°46'	1163.23	406.17	31.02			
MIL (S) USB-30	ANG-91 USB-30	1	22	26	13	1	22	35	59	9	45	51°59'	1072.26	323.94	31.04			
GFM (S) USB-30*	ANG-91 USB-30	1	22	26	45	1	22	36	19	9	34	31°26'	1274.35	340.99	31.06			
ANG-91 USB-30	ANG-91 USB-30	1	22	32	49	1	22	37	14	4	25	2°29'	1083.32	924.35	31.09			
BDA (S) USB-30*	ANG-91 USB-30	1	22	30	21	1	22	39	29	9	23	57°08'	1031.61	186.42	31.11			
USS VANGUARD	ANG-91 USB-30	1	22	34	20	1	22	42	51	8	31	82°38'	960.70	141.23	31.16			
CYI (S) USB-30*	ANG-91 USB-30	1	22	42	10	1	22	50	4	7	54	35°75'	809.87	193.45	31.23			
CRO (S) USB-30*	ANG-91 USB-30	1	23	16	56	1	23	27	46	10	49	21°92'	1194.74	555.95	31.42			
CNB (S) USB-85*	ANG-91 USB-30	1	23	24	23	1	23	35	57	11	33	25°56'	1253.33	545.09	31.70			
HAW (S) USB-30*	ANG-91 USB-30	1	23	47	38	1	23	52	2	4	23	1°54'	1231.74	1207.13	31.83			
USS HUNTSVILLE	ANG-91 USB-30	1	23	50	27	2	0	0	2	9	34	15°62'	1231.39	622.45	31.91			
GDS (S) USB-85*	ANG-91 USB-30	1	23	55	56	2	0	4	37	8	41	11°02'	1138.75	644.82	31.96			
GTM (S) USB-30*	ANG-91 USB-30	1	23	56	3	2	0	5	57	9	53	51°66'	1176.09	228.11	31.97			
WHS-15 (FPS-16M)	ANG-91 USB-30	1	23	57	44	2	0	7	3	1	33	30°77'	1177.95	323.67	31.98			
TEX (S) USB-30*	ANG-91 USB-30	1	23	59	22	2	0	8	45	9	23	49°16'	1073.34	219.03	32.03			
MIL (S) USB-30*	ANG-91 USB-30	2	0	3	41	2	0	12	18	8	36	31°10'	1097.83	274.77	32.05			
GFM (S) USB-30*	ANG-91 USB-30	2	0	4	26	2	0	12	40	8	14	19°05'	1084.13	396.69	32.08			
ANG-91 USB-30	ANG-91 USB-30	2	0	43	2	0	13	54	2	11	480	917.31	917.31	32.08				
BDA (S) USB-30*	ANG-91 USB-30	2	0	7	24	0	15	55	8	24	47.51	1030.08	177.64	32.10				

TABLE VIII.- ALTERNATE MISSION 3c DESCRIPTION - Continued
(c) Radar acquisition and loss summary for CSM - Continued

MSFN STATION	ACQUISITION	LOSS	ELAPSED TIME	MAX ELEVATION	MIN RANGE	REVOLUTION NUMBER
NAME	DAY HR MIN SEC	DAY HR MIN SEC	MIN SEC	DEG	N MI	
USS VANGUARD	2 0 11 18	2 0 19 38	2 0 25 27	7 57	759+6.3	32+14
CYI (S) USB-30*	2 0 19 38	2 0 53 49	2 1 5 46	5 49	780+14	32+20
CRO (S) USB-30*	2 0 53 49	2 1 52	1 1 57	30+6.8	1324+50	32+6.1
CNB (S) USB-85*	2 1 1 52	2 1 31	1 1 26	9+4.3	1324+45	32+6.7
HAW (S) USB-30*	2 1 21	2 1 31	10 21	23+8.2	1108+27	32+8.5
USS HUNTSVILLE	2 1 26	2 1 37	6 10	79+0.0	940+90	192+49
GDS (S) USB-85*	2 1 32	2 1 41	35 9	22+0.0	766+98	32+9.1
GYM (S) USB-30*	2 1 33	2 2 1 42	32 8	34+0.9	393+42	32+9.6
WHS-15 (FPPS-16H)	2 1 34	2 2 1 43	43 9	34+8.5	752+81	32+9.9
TEX (S) USB-30*	2 1 37	2 2 1 45	27 8	18+3.5	803+35	33+0.1
MIL (S) USB-30*	2 1 41	2 2 1 49	14 8	22+9.5	747+17	310+26
GBM (S) USB-30*	2 1 41	2 2 1 49	47 7	22+6.1	894+16	299+87
BDA (S) USB-30*	2 1 44	2 2 1 52	12 7	21+9.2	593+97	33+0.6
ANG-91 (S) USB-30	2 1 47	2 2 1 53	30 6	7+22	759+82	571+41
USS VANGUARD	2 1 49	2 2 1 54	34 5	5+18	866+57	639+83
ACN (S) USB-30*	2 2 0	2 2 2 0	22 7	13+0.7	466+21	471+79
CRO (S) USB-30*	2 2 30	2 2 4 20	12 34	6+2.29	1220+85	311+66
GYM (S) USB-30*	2 2 45	2 2 5 28	2 19	5+1.4	1333+48	1078+87
HAW (S) USB-30*	2 2 58	2 2 5 30	8 19	35+1.3	1247+00	310+55
USS HUNTSVILLE	2 3 4	2 3 5 1	13 34	16+1.6	841+89	464+25
GDS (S) USB-85*	2 3 9	2 3 16	1 30	33+0.71	986+78	239+93
GYM (S) USB-30*	2 3 10	2 3 19	25 8	19+7.4	791+01	346+18
WHS-15 (FPPS-16H)	2 3 12	2 2 2 20	16 15	70+2.9	946+65	138+99
TEX (S) USB-30*	2 3 14	2 2 2 20	7 54	38+4.9	552+05	196+43
MIL (S) USB-30*	2 3 18	2 2 2 25	53 7	29+4.1	910+97	227+37
GBM (S) USB-30*	2 3 18	2 2 3 26	32 7	33+0.94	865+50	202+78
BDA (S) USB-30*	2 3 23	2 2 3 26	46 3	2+1.1	847+92	779+40
ANG-91 (S) USB-30	2 3 23	2 2 3 31	23 7	24+7.6	731+27	259+10
ACN (S) USB-30*	2 3 37	2 2 4 45	53 8	19+2.8	837+75	408+15
CRO (S) USB-30*	2 3 48	2 2 4 49	19 10	16+6.5	1216+34	733+10
GBM (S) USB-30*	2 4 20	2 2 4 56	32 11	39+9.9	1073+15	356+62
HAW (S) USB-30*	2 4 36	2 2 4 44	38 7	11+1.6	967+87	602+41
USS HUNTSVILLE	2 4 42	2 2 5 50	21 7	13+3.4	735+69	472+01
GDS (S) USB-85*	2 4 46	2 2 5 54	6 7	15+3.0	646+24	384+34
GYM (S) USB-30*	2 4 48	2 2 5 56	15 7	75+9.2	502+31	123+85
WHS-15 (FPPS-16H)	2 4 49	2 2 5 56	22 7	14+2.1	717+81	400+67
TEX (S) USB-30*	2 4 51	2 2 5 58	53 7	15+4.2	800+36	371+73
MIL (S) USB-30*	2 4 56	2 2 5 58	3 51	2+2.8	888+99	769+36
GBM (S) USB-30*	2 4 57	2 2 5 58	1 19	2+2.7	792+18	770+62
ANG-91 (S) USB-30	2 5 2	2 2 5 58	4 4	2+4.9	866+27	793+75
ACN (S) USB-30*	2 5 16	2 2 5 58	21 4	2+5.0	1111+13	1015+46
USS MERCURY	2 5 16	2 2 5 58	2 14	11+1.2	1307+67	774+01
GYM (S) USB-30*	2 5 58	2 2 6 52	9 5	19+2.2	1117+71	527+64
HAW (S) USB-30*	2 5 58	2 2 6 52	3 51	7+4.9	801+28	629+86
USS HUNTSVILLE	2 6 19	2 2 6 52	2 27	28+5.9	866+67	237+72
GDS (S) USB-85*	2 6 25	2 2 6 58	30 3	1+6.5	879+22	807+28
GYM (S) USB-30*	2 6 25	2 2 6 58	31 0	6+7.9	827+01	577+91
GWH (S) USB-30*	2 7 38	2 2 7 43	4 27	1+9.7	1031+10	1009+07
USS MERCURY	2 7 38	2 2 7 43	10 18	52+2.6	1266+01	244+38

TABLE VIII.- ALTERNATE MISSION 3c DESCRIPTION - Continued

(c) Radar acquisition and loss summary for CSM - Continued

MSFN STATION	ACQUISITION	LOSS	ELAPSED TIME	MAX ELEVATION	MAX RANGE	MIN RANGE	REVOLUTION NUMBER
NAME	DAY HR MIN SEC	DAY HR MIN SEC	MIN SEC	DEG	N MI	N MI	
HAW (S) USB-30*	2 7 51 59	2 7 59 21	7 22	14.51	880.65	392.94	36.84
USS HUNTSVILLE	2 7 56 0	2 8 4 8	7 6	15.37	640.31	366.68	36.87
USS MERCURY	2 9 10 0	2 9 19 10	9 10	23.05	1108.62	396.64	37.63
HAW (S) USB-30*	2 9 28 45	2 9 36 17	7 31	29.47	563.20	221.31	37.81
USS REDSTONE	2 9 45 53	2 9 50 59	5 5	3.34	1022.21	675.65	37.96
ACN (S) USB-30*	2 10 11 4	2 10 17 35	6 30	3.56	1292.16	1207.18	38.24
USS MERCURY	2 10 48 2	2 10 55 51	7 49	13.67	1010.95	479.43	38.62
USS REDSTONE	2 11 20 9	2 11 56 9	9 47	40.13	1012.28	273.12	38.96
ACN (S) USB-30*	2 11 46 18	2 11 57 46	11 28	21.25	1391.93	634.78	39.25
USS MERCURY	2 12 25 16	2 12 33 8	7 51	17.04	765.80	371.61	39.63
GWM (S) USB-30*	2 12 31 49	2 12 38 4	6 14	8.50	816.39	555.27	39.67
USS REDSTONE	2 12 56 43	2 13 7 19	10 36	31.37	1129.31	388.18	39.97
ACN (S) USB-30*	2 13 22 59	2 13 35 10	12 10	41.13	1179.52	393.44	40.24
USS MERCURY	2 14 22 22	2 14 54 7	3 1	26.41	924.34	244.25	40.61
GWM (S) USB-30*	2 14 8 2	2 14 44 7	4 1	26.49	828.50	247.68	40.66
USS REDSTONE	2 14 33 59	2 14 44 54	10 54	22.00	1280.93	545.47	40.98
ACN (S) USB-30*	2 15 2 18	2 15 44 7	7 25	5.00	1366.39	1055.11	41.19
CYI (S) USB-30*	2 15 7 3	2 15 45 8	5 5	7.17	1128.72	917.71	41.25
USS MERCURY	2 15 42 5	2 15 42 47	0 42	.32	877.94	877.94	41.57
USS REDSTONE	2 16 10 58	2 16 22 52	11 54	35.30	1317.60	428.57	41.98
ANG-91 USB-30	2 16 32 41	2 16 39 40	6 59	4.65	1197.99	1109.72	42.11
CYI (S) USB-30*	2 16 42 32	2 16 52 48	10 15	36.49	1039.91	322.60	42.24
MAD (S) USB-85*	2 16 47 36	2 16 55 0	7 24	6.93	1077.21	783.20	42.28
CNB (S) USB-85*	2 17 29 17	2 17 36 42	7 24	7.35	1168.49	785.70	42.72
USS REDSTONE	2 17 47 52	2 18 0 17	12 24	63.63	1274.22	306.42	42.95
BDA (S) USB-30*	2 18 12 40	2 18 16 42	4 2	1.51	1222.15	1193.89	43.11
ANG-91 USB-30	2 18 17 20	2 18 18 27	11 7	31.73	1209.01	423.93	43.13
USS VANGUARD	2 18 13 44	2 18 22 17	8 33	10.28	1180.52	754.05	43.15
CYI (S) USB-30*	2 18 19 45	2 18 29 26	9 40	38.44	1077.10	276.50	43.25
MAD (S) USB-85*	2 18 23 35	2 18 31 39	8 4	12.59	985.67	542.32	43.27
CRO (S) USB-30*	2 18 56 40	2 19 5 1	8 20	14.56	1042.21	516.10	43.61
CNB (S) USB-85*	2 19 4 20	2 19 14 36	10 16	25.53	1272.49	436.63	43.73
USS REDSTONE	2 19 25 33	2 19 36 4	10 31	13.90	1268.30	807.91	43.92
TEX (S) USB-30*	2 19 41 55	2 19 45 18	3 23	.99	1293.71	1247.75	44.01
MIL (S) USB-30*	2 19 42 46	2 19 51 37	8 51	9.61	1059.60	805.23	44.07
GBM (S) USB-30*	2 19 42 33	2 19 52 18	9 44	15.31	991.24	637.25	44.07
BDA (S) USB-85*	2 19 46 21	2 19 55 42	9 21	14.75	1273.37	624.46	44.11
ANG-91 USB-30	2 19 46 47	2 19 55 1	10 14	25.70	1023.27	435.02	44.11
USS VANGUARD	2 19 49 39	2 19 59 28	9 48	32.06	1087.67	333.72	44.16
CYI (S) USB-30*	2 19 57 27	2 20 6 3	8 35	23.91	915.49	331.85	44.23
MAD (S) USB-85*	2 20 0 26	2 20 7 34	7 7	10.11	744.64	552.15	44.26
CRO (S) USB-30*	2 20 32 31	2 20 42 41	10 10	40.58	1201.26	279.68	44.62
CNB (S) USB-85*	2 20 40 31	2 20 51 54	11 22	45.22	1062.35	330.39	44.71
GYM (S) USB-30*	2 21 13 30	2 21 21 16	7 46	6.19	1206.85	958.45	44.98
WHS-15 (FPS-16M)	2 21 15 46	2 21 22 7	6 20	3.93	1227.12	1060.00	44.98
TEX (S) USB-30*	2 21 15 7	2 21 25 5	9 57	1.83	1081.90	563.58	45.03
MIL (S) USB-30*	2 21 18 38	2 21 28 56	10 17	46.64	1000.05	265.98	45.07
GBM (S) USB-30*	2 21 18 57	2 21 29 22	10 25	79.98	967.83	200.87	45.07
ANG-91 USB-30	2 21 24 3	2 21 30 45	6 42	5.12	1137.36	848.55	45.10

TABLE VIII.- ALTERNATE MISSION 3c DESCRIPTION - Concluded
 (c) Radar acquisition and loss summary for CSM - Concluded

MSFN STATION NAME	ACQUISITION			LOSS			ELAPSED TIME			MAX ELEVATION			MAX RANGE			MIN RANGE			REVOLUTION NUMBER		
	DAY	HR	MIN	SEC	DAY	HR	MIN	SEC	N	MIN	SEC	DEG	N	MIN	SEC	N	MIN	SEC	N	MIN	SEC
BDA (S) USB-30*	2	21	22	45	2	21	32	26	9	40		46.33	1036.73	230.59	45.12						
USS VANGUARD	2	21	26	44	2	21	36	0	9	15		41.96	766.37	227.19	45.15						
MAD (S) USB-85*	2	21	38	18	2	21	41	55	3	36		1.94	947.01	822.32	45.22						
CYI (S) USB-30*	2	21	34	44	2	21	42	57	8	12		33.13	800.07	229.45	45.24						
CRO (S) USB-30*	2	22	9	33	2	22	20	5	10	32		24.75	1025.45	472.71	45.61						
CNB (S) USB-85*	2	22	17	6	2	22	28	49	11	43		35.58	1320.79	418.17	45.71						
USS HUNTSVILLE	2	22	43	48	2	22	52	33	8	44		9.25	1256.85	860.37	45.92						
GDS (S) USB-85*	2	22	49	42	2	22	57	23	7	40		6.93	1173.63	845.38	45.97						
GYM (S) USB-30*	2	22	49	44	2	22	59	7	10	22		33.82	995.67	351.92	45.99						
WHS-15 (FPPS-14H)	2	22	50	31	2	23	0	9	9	38		19.20	898.60	502.19	45.99						
TEX (S) USB-30*	2	22	51	43	2	23	1	58	10	15		44.57	1121.08	273.13	46.01						
HIL (S) USB-30*	2	22	56	0	2	23	5	31	9	31		34.24	1111.62	296.45	46.04						
GFM (S) USB-30*	2	22	56	39	2	23	5	51	9	11		21.64	820.80	395.73	46.06						
ANG-91 USB-30*	2	23	3	47	2	23	6	50	3	2		.84	992.57	967.01	46.09						
BDA (S) USB-30*	2	23	0	0	2	23	9	2	9	1		56.07	1043.77	184.88	46.11						
USS VANGUARD	2	23	0	59	2	23	12	22	8	22		55.60	971.88	164.89	46.14						
CYI (S) USB-30*	2	23	12	1	2	23	19	11	7	9		13.19	866.43	409.20	46.22						
CRO (S) USB-30*	2	23	46	42	2	23	57	57	11	14		25.87	1089.73	512.50	46.41						
CNB (S) USB-85*	2	23	54	15	3	0	4	48	10	33		14.13	1339.55	793.04	46.69						
HAW (S) USB-30*	3	0	14	27	3	0	23	55	9	28		13.52	1354.65	728.12	46.84						
USS HUNTSVILLE	3	0	19	30	3	0	29	28	9	57		48.05	1271.11	249.00	46.90						
GDS (S) USB-85*	3	0	25	41	3	0	33	26	7	44		16.57	1106.24	402.55	46.94						
GYM (S) USB-30*	3	0	26	21	3	0	34	25	8	3		41.28	1085.88	187.11	46.96						
WHS-15 (FPPS-14H)	3	0	27	47	3	0	35	24	7	37		54.63	1054.34	136.56	46.97						
TEX (S) USB-30*	3	0	30	9	3	0	36	41	6	32		16.90	974.76	287.09	46.97						

TABLE IX.- MANEUVER PLAN FOR THE ALTERNATE RENDEZVOUS PLAN^a

Event	Rev no	g.e.t., day.hr:min	Burn time sec	ΔV , fps			IMU Alignment	Resultant Ellipse h_a/h_p , n. mi.	TVC Mode primary	TVC Mode secondary	Station Contact	Comment
				Total	ΔV_x	ΔV_y						
Orbit insertion	1							123/153			ETR	Nominal insertion
SM RCS phasing burn	3	00:03:20	19.2	7.5	-7.5	0	0	Launch	127/170	SCS	ANG	Set up proper phasing for rendezvous on 2nd day
SM RCS phasing burn	18	1:03:30	28.7	11.18	-11.18	0	0	Preferred	122/165	GNCS	SCS	Set up proper phasing for rendezvous on 3rd day
First SPS burn	31	2:00:41	10.0	217	56	2	210	TPI	122/189	GNCS	CRO	Corrective combination maneuver
Second SPS burn	32	2:02:18	9.1	203.6	-91	0	-182	TPI	110/148	GNCS	CRO	Concentric maneuver
SM RCS TPI burn	33	2:03:47	41.5	16.9	14	-1	-9	TPI	118/147	GNCS		Terminal phase initialization

^aRemainder of maneuvers approximate those in operational trajectory.

TABLE X.- DETAILED TEST OBJECTIVE EVALUATION FOR THE APOLLO 7 ALTERNATE MISSIONS^a

Alternate mission	Radiator test	GNCS ΔV control	SCS ΔV control	Sextant tracking	CSM-active rendezvous	Transposition and docking	SLA photography	Minimum impulse	SPS performance and gauging tests	GNCS/MTVC ΔV control	Comments
1a	*	*	✓			✓	✓				
1b	*	*	✓			✓	✓				
1c	X	X	*			✓	✓				
1d	X	X	*	✓		✓	✓	*	✓		S-IVB related test objectives satisfied if COI = 0
2a	✓	✓	✓	✓	X	X					
2b	✓	✓	✓	✓							
2c	✓	✓	✓	✓				✓		X	Manual take-over burn must be at least 35 seconds long
3a	✓	✓	✓	✓				✓	✓	✓	
3b	✓	✓	✓	✓				✓	✓	✓	
3c	✓	✓	✓	✓				✓	✓	X	Manual take-over burn must be at least 35 seconds long
Alternate rendezvous	✓	✓	✓	✓				✓	✓	✓	

^a [✓ - Fulfilled
* - Partially fulfilled
X - Possibly fulfilled]

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SC-101. May 20, 1968.
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